

# The Canadian Medical Association Journal

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## THE OSLER MEMORIAL CELEBRATION

IN one respect, at least, the annual meeting of the Canadian Medical Association, recently held in Montreal, differed from its predecessors. For the first time the memory of Canada's greatest physician was officially honoured by having a special day set aside, which was called "Osler Day." On that day the Osler Library in the building of the McGill Medical School, with its great treasures, was open to inspection, and in an adjacent room and in the Reading Room of the Medical Faculty Library there was a most interesting display of "Osleriana," consisting of rare books, photographs, association articles, and a collection of specimens of morbid anatomy, collected by Osler, notably aneurysms, and cases of endocarditis, the latter of which afforded him the material for his Goulstonian Lectures.

It is impossible to deal adequately with the books on exhibition in the small amount of space available to us, but a few works of special interest and importance may, perhaps, be referred to.

Among the Incunabula were the Venetian edition of Lueretius' *De rerum natura* (1495), of which Osler said that the famous "tellus dura" passage could be transferred to any modern textbook of anthropology. There was the great Aldine edition of Aristotle of 1495. There was the Florentine text of Celsus, of 1478. The first work written on the diseases of children, that of Bagellardus (1472) was there. Among other early works were the Venetian edition of Hippocrates (1526); The editio princeps of Euclid (in Greek), of 1533; the *Bibliotheca Universalis* of Gesner (1545), the first published work of bibliography; the work of Copernicus, dealing with the macrocosm for the first time in a scientific way, and the *De Humani Corporis Fabrica* of Vesalius, concerned with the microcosm, also for the first time scientifically, both of which books, curiously, appeared in the same year, namely, 1543; Harvey's Letters to Riolanus, (1649), the rarest of Harvey items; the first edition of Harvey's epoch-making work, the *De*

*motu cordis* (1628); Gilbert's *De Magnete* (1600), the first truly scientific book to be published in England, a book which established the fact of terrestrial magnetism and laid the foundation of the modern science of electricity. Jenner's treatise on Vaccination, the first edition (1798), another rare work, was also there. The special "points" of all these treasures were explained by the Librarian, Dr. W. W. Francis.

In the evening the members of the Association, their friends, and invited guests were assembled in force in the Windsor Hall to listen to the first "Osler Oration."

About a year ago a movement took shape to honour in some fitting way the memory of Sir William Osler. An oration, to be delivered triennially by some outstanding man, Scholarships, and, perhaps, Fellowships, were to be established, it was hoped. To this end a campaign for funds has been going on quietly. Something has been done, but much remains to be accomplished.

It was thought that, inasmuch as Osler was a student and professor at McGill University, and that the Sixtieth Annual Meeting of the Canadian Medical Association was this year to be held in Montreal, it would be entirely fitting to call upon one of the local men, one who had been, in the past, closely associated with Osler, to deliver the first Osler Oration. The choice fell upon the late Dr. Francis J. Shepherd, formerly Dean and Professor of Anatomy at McGill University, and a close friend of Osler's. It is much to be regretted that the death of Dr. Shepherd, which we greatly deplore, prevented his delivering his oration in person. However, he left his manuscript almost complete, and the duty of reading it was entrusted to Dr. H. A. Lafleur, another close associate of Canada's greatest physician.

The Osler Oration was delivered on June 20th, before a large audience. Dr. A. T. Bazin, the President of the Association, was in the chair, and with him on the platform were Dr.

Heurner Mullin, Chairman of the Osler Memorial Committee; Dr. Campbell Howard, Chairman of the Provincial Committee for Quebec; Dr. B. G. Bourgeois, President of the Province of Quebec Medical Association; and three Deans, Dr. C. F. Martin, of McGill University; Dr. L. deL. Harwood, Université de Montréal; and Dr. Arthur Rousseau, of L'Université Laval; and Dr. Henri A. Lafleur. A fine oil painting of Sir William Osler, loaned by McGill University decorated the platform.

The Chairman's remarks, which were brief, contained an interesting announcement. Dr. Bazin spoke as follows.

"HONOURED GUESTS, LADIES AND GENTLEMEN:

Six years ago, to celebrate the centenary of the birth of Joseph Lister, the father and founder of Antiseptic Surgery, the Canadian Medical Association raised a fund of \$5,000.00 by subscription from among its members for the purpose of establishing a "Lister Memorial Oration." The capital is set aside in a "Trust Fund," invested in trust fund securities and the interest allowed to accumulate. Every three years the interest is used to defray the expenses of preparation and travel of an orator of eminence chosen to address the Association on some important subject of surgery.

The inauguration of the Lister Oration was held at the Ottawa meeting in 1924, the speaker being Dr. John Stewart, of Halifax, one of Lister's house-surgeons. The second address was given at the Toronto meeting in 1927, the speaker being Sir Charles Sherrington, of London, England.

Last year, a committee was formed to raise in like manner a similar sum to establish a Triennial Oration in honour of Osler. The inaugural address will be delivered to-night.

But inasmuch as Osler was one of us, a Canadian by birth and by education; inasmuch as he did his first clinical work in Canada and laid therein the foundation of his masterly book "The Practice of Medicine," the Osler Committee considers that more should be done to honour and perpetuate his name in Canada than a Triennial Oration presented before the annual meeting of the Canadian Medical Association. To this end the formation of Osler Societies is encouraged both among graduates and undergraduates in Medicine; Osler Scholarships are projected to be awarded to candidates nominated by the Faculties of Canadian Medical Schools or other responsible bodies, to permit of special study to advance medical knowledge or to improve the teaching of clinical medicine.

As Osler was a graduate of the McGill Medical School, as Montreal was the scene of his first clinical and teaching success, it is appropriate at this Montreal meeting not only to inaugurate the "Osler Memorial Address" but to announce that the two medical institutions of this city with which he was connected are to benefit from the establishing of "Osler Scholarships." A sum of \$6,000.00 has been generously donated to the Canadian Medical Association by Mr. J. W. McConnell. This money will be a "Trust Fund," will be invested in trust fund securities, and the interest accumulating over three years will be available to a candidate nominated by the Faculty of Medicine of McGill University, to permit such candidate to undertake such special studies as will make him or her better fitted to teach Clinical Medicine. As the Montreal General Hospital was Osler's first hospital, the President and five members of the Board of Management have donated a like sum under similar conditions, the candidate for the Scholarship to be nominated to the Canadian Medical Association by the Medical Board of that hospital."

Dr. Lafleur acquitted himself of his difficult task in a highly satisfactory way. He introduced his reading of the Oration with a few words of explanation, and concluded it with some very graceful and feeling remarks of his own. He said:—

"It is not without some reluctance that I have undertaken to present the address prepared by the late Dr. Shepherd for this occasion. No one can have quite the same feelings for an adopted child as for one's own flesh and blood, and it is not easy to show in its right perspective and its proper light, a portrait painted with another's brush and palette.

The selection of Dr. Shepherd to deliver the first Osler Oration before the Canadian Medical Association was a peculiarly happy and fitting one. He was the oldest surviving close friend, fellow student, and colleague in teaching during Osler's formative years at McGill—possessing an intimate personal knowledge of his earlier years in the profession, and a genuine appreciation of the man as well as of the physician. None other, if we except the late Dr. Geo. Ross, was equally fitted to do justice to this period of Osler's life.

The address is admirable in detail, and full of personal memories of this early period, while the later phases are broadly sketched with a due appreciation of the salient points. The style is characteristic of the man—rugged, at times somewhat disjointed, but always forceful.

This oration is a solid foundation upon which shall be built an enduring monument to Osler—a structure of many façades, in keeping with the wide range of his sympathies and activities, forming a harmonious whole which will give as complete a picture of the man and his work as is humanly possible, and serve as a guiding-

post to future generations of those who tread the long and arduous path of medicine.

I may add that I have made only necessary verbal alterations and corrections of typographical errors in the manuscript, with occasional transposition of paragraphs. It is substantially as Dr. Shepherd wrote it."

### THE OSLER ORATION\*

BY THE LATE FRANCIS J. SHEPHERD, M.D., LL.D., F.R.C.S.,

*Montreal*

IT is difficult at this recent date to estimate the value of Osler's work and activities. So much has been written about him, and everybody who has ever spoken to him or had some slight intercourse with him has rushed into print, and given his or her experience, and has estimated his good qualities and his influence on his personality or the medical community at large, that it is hard to sift the grain from the chaff. I, who was closely connected with him as a fellow student, friend, and colleague, for fifty years, yet feel it hard to judge the effect of his work and influence on his fellow practitioners and medical confrères.

There are certain outstanding activities to which he, a man of many interests, was specially attracted: (1) the bringing together of his fellow medical men by means of societies, etc., and being a peacemaker always; (2) the establishment of medical libraries and journal clubs, and the encouragement of students to read; (3) the encouragement of medical students to pursue lines of work outside the usual college curriculum, such as medical biography and history, etc.

He was always essentially a clinical teacher, and loved to have a class following him through the wards. In fact, he came to McGill from Toronto chiefly because of the clinical advantages of the Montreal General Hospital. At that time (1870) this hospital was the only one on this continent that allowed students to work in the wards. As a student he was not a slavish attendant at lectures, nor did he take elaborate notes, as was the custom then, but he was usually to be found in the wards of the hospital or in the post-mortem room. He did not take a high place in class (for then that was taken by the man with the best verbal memory), but his thesis

on his own pathological work, illustrated by specimens, was given a special prize for originality.

His influence on students and young graduates, and his suggestion of lines of work and his encouragement in forwarding it, are well known. His presence was always an inspiration; he never failed to incite the love of his fellow workers and to make them feel that he was one of themselves. His manner was hearty and open, and his memory for individuals was marvelous. He never forgot old friends, however numerous his new ones. Wherever he went he was an element of good in that community, and his personality was soon felt. As the late Dr. R. P. Howard once said, he was a "potent ferment". Any new method of diagnosis was seized upon by him, elaborated and investigated, e.g., Laveran's discovery of the malarial organism. He was one of the first to explore and confirm the discovery. He was much interested in public health, and his work in popularizing the open-air treatment of tuberculosis is well known, as is his founding of many societies for the prevention of this disease.

Osler had a great sympathy for the general practitioner, a great respect for his virtues and much knowledge of his arduous life. He seemed to feel for all his troubles and hardships, and when such practitioners visited his hospitals he paid them every attention. I have often heard him tell of what they have done and of what is due to them.

Dr. A. McNair Wilson, author of *The Beloved Physician* (the Life of Sir James Mackenzie), says (p. 182), "It was my great privilege and honour to make the acquaintance of the late Sir William Osler some years before the end of his life. I was struck, as all men were struck, with the bigness and generosity of his nature, the

\* The First Osler Oration, read by Dr. H. T. Lafleur at the Annual Meeting of the Canadian Medical Association, Montreal, June 20, 1929.

goodness and sweetness of the man. I realized why Mackenzie always spoke his name with delight and affection. 'Osler', he once told me, 'came to see me when no other of the great physicians would have dreamed of coming'."

As I said before, so much has been written about Sir William Osler that it is difficult, if not impossible, to say anything new, but a short biographical sketch is necessary in this first Memorial Lecture. He himself said in the dedication of the Wistar Institute of Anatomy in Philadelphia, "In the continual remembrance of a glorious past individuals and nations find their noblest inspirations", and, again, "Year by year the memory of men who made this institution fades from out the circle of the hills and the shadows of oblivion fall deeper and deeper over their forms until a portrait or perhaps a name alone remains to bind the dead with the quick". It is with the object of preserving his memory that this series of orations has been instituted, and, as in the case of the great Harvey and of John Hunter, I trust it will be successful in perpetuating the work and doings of William Osler.

He was born July 12, 1849, and was named William after the great William of Orange. He was the sixth son of the Rev. F. L. Osler, M.A. (Cantab), a Church of England clergyman, afterwards Archdeacon, who was priest, counsellor, and adviser of the Protestant Irish settlers north of Toronto, and his son's first guide and teacher. Osler's mother was also a notable person, a woman who, against the wishes and desires of her family, married the Rev. Mr. Osler and came out with him as the wife of a missionary to what were then the wilds of Canada. From her Sir William inherited much, and through her early care and counsel much of his character was formed. His father, feeling the need of giving his sons a better education, decided to exchange his mission at Bond Head for the comparatively more settled region of the Dundas Valley, where there was a good grammar school presided over by a graduate in classics of Trinity College, Dublin. In Dundas Sir William's boyhood was passed. "From this period we began to hear of the laughing, good-natured boy, quick at studies, good at games, straightforward and unafraid, with an affectionate interest in all his associates, an interest which never died." (Gwyn). And now came into his

life an influence which did much to shape his after career. He was placed under the Rev. W. A. Johnson at Weston, a teacher who inspired his receptive pupil and first gave him the love for natural history which early possessed him. At that time the microscope was little used and not well known in Canada, but his teacher was an accomplished microscopist, and the pupil took advantage of his opportunities. There was instilled into the young boy, as he says himself, the love of "the old humanities and the new sciences". For three years he was under the tuition of the Rev. W. A. Johnson. After he left school he had a year at Trinity University preparing for the Church, to which all his training was inclined to lead him. However, he soon changed his mind and left Trinity for the Toronto School of Medicine. Here he came under the influence of James Bovell, physician, naturalist, and afterwards priest. James Bovell must have had a wonderful attraction for him. The impress of this man's teaching was visible in Osler long after he had taken his degree. Many committees and other meetings we attended together when he was a professor at McGill. If one looked at the paper or blotter before Osler one found innumerable scribblings which were always the same, "James Bovell, James Bovell," repeated many times. Apparently this was done unconsciously. James Bovell increased in him the love of microscopic work first inspired by the Rev. W. A. Johnson. After a couple of years at the Toronto School of Medicine, he and a number of his friends came to McGill Medical School, chiefly because of the clinical advantages afforded by the Montreal General Hospital, and the opportunities for morbid anatomy.

The Toronto students joined McGill in 1870. I was then in my second year, having begun my studies in 1869. As I remember Osler in 1870, he was a thin, eager, energetic youth, with sharp, dark, piercing eyes, and a sallow complexion, restless, interested in everything and everybody, busy with his microscope, and always ready to give good advice and to help his neighbour. He was popular amongst the good students, but had no use for idlers and shirkers.

After his graduation in 1872 he went abroad, and I followed him a year after. I met him again in London before he left for home to

take the Chair of Physiology. He at that time communicated a paper to the Royal Society on the micro-organisms of the liquor sanguinis. In the autumn of 1875 I also went home to Montreal, as Demonstrator of Anatomy, and again was thrown into close contact with William Osler.

When abroad he had studied in London under Burdon Sanderson, and was a close friend of Edward (now Sir Edward) Sharpey-Shafer, who at that time was also at University College. In Berlin he studied under Virchow and in Vienna under Rokitansky. Of both these men he has written as he saw them at that time.

When in Montreal (1874-84) he worked hard at morbid anatomy, and gave a weekly demonstration on the various specimens collected to students and practitioners. He took a live interest in the Montreal Medico-Chirurgical Society, doing much work himself and stimulating others. He also made friends with his French-Canadian brother practitioners, and induced many of them to join the society. His influence everywhere was stimulating. Some of the older members of the Faculty looked upon him askance, as a too violent reformer. However, the younger members, such as Ross, Roddick, Buller, Gardner, MacDonnell, and others, strongly supported his reforms. He established the first physiological laboratory at the McGill Medical School, and made suggestions for reform in the teaching of other subjects. He, with Ross and myself, established a medical society which still functions.

In 1878 Ross and Osler went to England, where Osler took his M.R.C.P., and they followed Murchison in the wards.

In 1883 some deaths and many resignations took place. Professors MacCallum and Wright resigned. Dr. Scott, Professor of Anatomy, died. Professor George W. Campbell, who had been Dean for many years, had died in Edinburgh in 1882. He was a man of strong personality, and he was always on the lookout for promising young men. He strongly supported Osler. He was followed in the Deanship by Dr. Robert Palmer Howard, who was one of the three men whom Osler mentions as having strongly influenced him, and one of the three men to whom he dedicated his Practice of Medicine. Dr. Howard was an exceptional clinical teacher, and always followed his fatal

cases to the post-mortem room, and this encouraged and stimulated Osler.

In 1884 Osler went abroad and left his correspondence in my hands. A letter came from the Medical Faculty of the University of Pennsylvania asking him to be a candidate for the Chair of Clinical Medicine. I immediately forwarded it to Osler, advising him to accept. He at first thought that this was a joke Ross and myself were playing on him. However, he met others, such as Weir Mitchell, in London, who confirmed the offer. The call was not unanimous for Dr. Horatio Wood was unconvinced. So he paid a visit to Montreal, got in touch with the French doctors at the Notre Dame Hospital, and then came on to the Montreal General Hospital, where he went around with Dr. Richard MacDonnell, who did not know him, lunched with the internes, and heard all about Osler. Everybody, of course, was enthusiastic about him. I came to the hospital at my usual hour and met Dr. Wood at noon. I recognized him, and then taxed him with having come to spy out the land. He admitted the fact, and then asked me about Osler, and he heard the truth. He went home convinced that Osler was the man, and afterwards strongly supported him. That year, 1884, Osler was elected President of the Canadian Medical Association. He left McGill on six months' leave in the autumn of 1884, after a farewell luncheon, where a very affecting and appreciative speech was made by Dr. Howard, the Dean, to which Osler, owing to his deep emotion, had much difficulty in replying.

So Osler went to Philadelphia, and we were all desolate. But he came back frequently. He was given leave for six months, and if he was dissatisfied with Philadelphia and his work at the University, the door was left open for his return. At first he was a disappointment to the students there, who had been accustomed to eloquent clinical lectures from orators who spoke to crowded benches in the large amphitheatre, but often without patients to illustrate the lectures, and if a patient was occasionally obtained he was seen only from a distance. Now Osler was not an orator, and had rather a halting delivery, but he never gave a lecture without a series of patients to illustrate it, and he took classes of students through the wards and

brought them in immediate contact with the patient and disease, and after he had beds in the Blockley Hospital he followed up his fatal cases with a post-mortem in which the students immediately concerned in the case participated. After a time it was seen that this method of teaching was most informing, and soon his classes became the most popular in the University, for his joyous and familiar manners, his intense energy, earnestness, and friendliness appealed to the students, and his working out cases with them and his way of identifying himself with them was most taking. They all felt that they were helping in the diagnosis of the case. This was a most subtle way of interesting the student, and he now established a clinical laboratory in a small room at the end of one of the wards, for the examination of blood, sputum, etc., and every student was made to take part in these methods, up to that time unknown in the hospital for purposes of diagnosis. He all the time was giving lectures before societies and writing papers. He was elected a member of the College of Physicians and Surgeons and took a great and active interest in their fine library, of which he was made a member of the Committee. In fact, the medical community felt that a new force had come among them, stirring them up to better work. He attended the medical society with great regularity, and brought the Jefferson school and the University men into closer touch. He made many friends, among whom his especial friends were the Grosses and the Hays, and wherever there were children he made special friends of them.

Dr. Ross and myself made frequent visits to Philadelphia, and saw how much he had worked his way into the hearts of the profession and how much he was thought of. In 1889 came the first meeting of the triennial association of the various societies, to which many foreigners, and English and Canadian doctors were invited,—Esmarck from Germany, Ferrier and the Horsleys and Sir William McCormick from England, and many of the men from Toronto and Montreal. On the way home some of us stopped off at Philadelphia, where a great welcome awaited us, and many entertainments. My wife, who had remained with friends in New York, was brought to Philadelphia by Osler without my knowledge, and she met me there, much to my surprise, and she participated with me in many

of the lunches and dinners offered to the visitors (a touch of the thoughtfulness of Osler). They were most pleasant, and we had the opportunity of meeting many celebrated physicians and surgeons from abroad. Dr. Horatio Wood, now a great advocate of Osler, was among the most active of the entertainers, and Dr. and Mrs. Samuel Gross and the Hays.

About this time the Medical School of Johns Hopkins was being organized by Dr. Billings, and there was then some talk of Osler's being called there to organize the Medical Department of the Faculty. Of course, the Philadelphians were much opposed to losing so celebrated a teacher, but he accepted the call, feeling that he would have a free hand to introduce teaching methods which appealed to him as necessary to the advancement of any school which wished to be in the forefront of medical teaching.

I remember once crossing the Atlantic with Dr. Billings, and he told me that the greatest thing he had done, and on which he most congratulated himself, was the appointment of Drs. Welch and Osler to Johns Hopkins.

Perhaps Osler's reputation in the future will depend on his teaching of modern clinical medicine, combined with his knowledge of morbid anatomy. At a time when the microscope was little known by the medical profession, he was using it to elucidate the various problems that presented themselves; also his connection with the Veterinary College affiliated to McGill enabled him to make use of much material that would otherwise have been lost. He had a marvellous capacity for exact observation and thoroughness of investigation. He gained complete knowledge of his subject and was never superficial. He it was who introduced, through Johns Hopkins and the University of Pennsylvania, bedside-teaching into the University medical schools of the United States. Whilst at Johns Hopkins he wrote the best text-book on the "Practice of Medicine" ever written, compact, lucid and free from verbosity, from his own clinical experience, chiefly obtained during his stay in Montreal. It went through many editions and supplanted all other textbooks of medicine.

In his teaching he inspired all his students, and taught them by his human sympathy to treat their patients as human beings and not as cases. At Johns Hopkins his influence was paramount.

He regarded all his students as friends, and kept open house for them and their friends, who were constantly visiting the hospital.

In 1889 Osler sustained the serious loss of two old friends, Dr. R. Palmer Howard, and Dr. Sampson of Philadelphia; both died of pneumonia.

At a dinner of six hundred medical men given at the Waldorf Hotel, New York, in May, 1905, before he left for Oxford, Professor J. C. Wilson said of his Philadelphia period, "Not only by precept but by example has he been an uplifting influence on our professional life. . . . the source of that influence is to be sought not merely in his accomplishments as a physician, not in learning, not in wisdom, not even in his buoyant well-balanced temperament, but in that basic principle which we all recognize but never can define; which, for want of a descriptive name, we call 'character'." Dr. W. H. Welch, at the same dinner, said, "His most striking contribution to the life of Johns Hopkins has been the interest which he has aroused amongst students and the personal influence which has enabled him to bring out in them the best of their moral and intellectual points." This feature, as Dr. A. Jacobi has justly said, "has been a labour of love and no hardship."

Whilst at McGill he instituted many reforms and innovations, and, supported by a number of eager and enthusiastic young men, brought the dead bones of the Faculty to life again. He was a continual inspiration to his colleagues and the students. He made morbid anatomy, aided and supported always by the Dean, Dr. R. Palmer Howard, a subject eagerly followed by the students. Whilst a physician to the Montreal General Hospital he edited the first volume of his celebrated Pathological Reports. Dr. Maude Abbott says that the specimens described are still in the museum, having escaped the fire of 1907, also that the wonderful specimens of endocarditis on which his Goulstonian Lectures were founded are still in good preservation.

Osler was fond of practical jokes, which he was continually playing on his medical friends and associates, but they were always harmless and intensely amusing, for he had a wonderful sense of humour and was never downhearted, for, being an optimist, he saw the brightest side of everything. By nature and upbringing

he was intensely religious and was well read in the Bible. When a student he was an ardent attendant at St. John's Church, a very "high" one, and under the care of the Rev. Edmund Wood. He was often seen at early service before breakfast. The church was at the corner of the street he lodged in, St. Urbain and Dorchester. He was intended for the Church and had, as I have said, attended the divinity lectures of Trinity College, Toronto.

Osler always took a great interest in epidemic diseases. When in Montreal he was appointed physician to the smallpox hospital, which at that time was an appendage to the Montreal General Hospital, and, to become better acquainted with the disease, caught it himself, very mildly, fortunately, for he was well vaccinated.

His text-book and various articles show that he was well acquainted with the work of the early epidemiologists. Although smallpox, cerebro-spinal fever and syphilis interested him greatly, and were the subjects of addresses, yet he was more interested in typhoid fever, which was rampant in Baltimore when he was there. Typhoid fever, he said, was a sanitary index of the community, and the United States was a generation behind Europe. When the late war commenced, he was strong on the anti-typhoid inoculation of the soldiers.

Osler's interest in tuberculosis was always great. He instituted many societies for the study and prevention of this disease. In 1902 he started the first tuberculosis dispensary in Baltimore, and he took an active part in connection with the anti-tuberculosis campaigns throughout the States. In England he helped to form the National Association for the Prevention of Consumption. In 1910 he started an Oxford branch of this Association.

Whilst in Montreal he became convinced of the contagiousness of tuberculosis, and also, with the late Principal McEachern, of the transmissibility of bovine tuberculosis to man, and at the same time of their difference. He was one of the first to recognize the contagiousness of bovine tuberculosis through infected teats and flesh insufficiently cooked. He was greatly interested in the work of Trudeau, of Saranac, and frequently visited his sanitarium, in every way co-operated with him, and on

every occasion discussed the benefits of open air treatment.

In 1904, after fifteen years at the University of Johns Hopkins, he was offered, and accepted, the post of Regius Professor of Medicine at Oxford, the first to be so appointed from this side of the Atlantic.

In Oxford, and in England, he soon made his presence felt, though his free and easy manners rather astonished the "grave and reverend seniors." He at once identified himself with the work of the Radcliffe Infirmary. Every Sunday morning he had at 10.00 o'clock, a clinic for students and practitioners in the wards of the Infirmary, which were well equipped with laboratories, and this clinic became very popular. On Tuesday afternoon he always had a class in the Infirmary for physical diagnosis.

"At Ewelme, fourteen miles from Oxford, one of the most picturesque villages in England, Alice of Suffolk, granddaughter of Geoffrey Chaucer, founded in 1437, an almshouse for thirteen old men of the district, and in a beautiful church beside it she lies buried. The Regius Professor of Medicine is Master of Ewelme, and Sir William took a lively interest in all its affairs. He found all the old records a mass of mould, he left them bound together in huge volumes preserved for all time in a fireproof safe in the muniment room." (Malloch). It was a great delight to Sir William and Lady Osler to take visitors out to see this quaint old place, so secluded from the world and having a character of its own. Ewelme was especially attractive to American visitors.

Of course you all know what a vital interest Sir William took in libraries and he was a delegate to the Clarendon Press. In Oxford his greatest interest after the medical one was the Bodleian Library. He was one of the eight *ex officio* Curators. When at McGill, curiously enough, he never took much interest in its fine library. I should know, for I was librarian at the time. I think he acquired his interest in libraries in Philadelphia when connected with the College of Physicians and Surgeons and its magnificent library. Then, in Johns Hopkins he instituted Students' and Historical Libraries. However, when he reached Oxford his taste was well developed and he was continually adding to his own library by searching sale

catalogues and by trips to the continent, for I remember receiving at these times old books on surgery and anatomy from Rome and elsewhere. This passion for collecting rare medical books continually increased, and when he died he bequeathed his fine library to his old alma mater, McGill, where we hope to install it this year.

He was soon as overworked at Oxford as he had been at Johns Hopkins, which was the ostensible reason for his leaving. He was interested in the Royal College of Physicians, of which he had been a Fellow for many years, in the Royal Society of Medicine and its meetings and library. When the war came he was on many committees and visited many hospitals, especially the American and Canadian, and all the medical men from overseas he entertained and advised. His house at Oxford was called the "Open Arms," for during the war all medical men were welcomed by Sir William and his wonderful wife, and from the Canadian hospitals in England he frequently invited the nurses for week-ends.

He had a habit of reading in bed for half an hour before going to sleep, and always general literature; thus he got through an immense amount of both poetry and prose. He also kept a commonplace book in which he noted down anything that struck him as worth treasuring. He not only read but he remembered what he read, for he had a marvellous memory, not only for what he read but for his own and his colleagues' medical cases and pathological specimens. Sir William was President of the Classical Association, and, on May 16, 1919, he gave a remarkable address on "The Old Humanities and the New Sciences", which astonished his classical colleagues.

Dr. Lafleur continued:—

"The manuscript ends here. The last phase, rendered so pathetic by the death in action of his only son, during which, nevertheless, Osler maintained in public his usual unselfish cheerfulness while sorrow gnawed at his heart, during which too he kept himself steadfastly absorbed in all his medical and literary activities—was left untouched by Dr. Shepherd. We know that while Osler's physical powers waned, and he more readily showed fatigue, his mental faculties retained their acuteness and brilliance.

"May I be permitted to add a short personal tribute.

To have come into contact, even momentary, with Osler's vivid personality is a privilege; it is a greater privilege to have come under the influence of his teaching and example; it is an inestimable privilege to have been in close association with him for two and a half years in the work of a great modern hospital.

I have never known anyone who was surrounded by such a distinctive, attracting, personal "aura." It was something that was felt as well as seen. It commanded respect, admiration, and, to an even greater degree, affection. If to anyone, the much abused word "magnetism" was applicable to him in its best and truest sense. Imitation is said to be the sincerest form of flattery, and it is quite true that most of the young men who worked under him became imbued with something—if only an infinitesimal part—of his spirit and even of his manner, as well as with his methods of teaching and investigation.

Great learning he had — deep wisdom, shrewdness in the best sense of the term—but

his large charity, so different from mere *bonhomie*, which is common enough in small souls, was the quality that endeared him to all. He was intensely human and loved humanity. 'Homo sum, et nil humanum mihi alienum puto' might well have been his motto.

That he is, and is likely to remain, the outstanding figure of Canadian medicine none can dispute. That he was equally during his lifetime the outstanding figure of the English-speaking medical world, and possibly of world medicine, is maintained by many. The perspective of time will determine this, as it has done with other examples of high human endeavour and accomplishment."

Much interest was also added to the occasion by the presence of Dr. W. W. Francis, Osler's cousin, the Librarian of the Osler Library, who gave a graphic account of Osler's development as a bibliophile, and the establishment of the *Bibliotheca Osleriana*. His remarks follow in full.

#### THE OSLER LIBRARY

By W. W. FRANCIS, M.D., LIBRARIAN,

*Montreal*

THE Library which Sir William Osler bequeathed to McGill University, and of which I have the good fortune to be librarian, contains some 7,600 volumes, for the most part choice books, old and new, selected by a great master of the subject with a view to their value in the study of the history of medicine and science. It includes the greater part, but by no means all, of the books which filled his house at Oxford. A collection of works on the heart and lungs he left to the Johns Hopkins Hospital, and another, containing important editions in English literature, went to form the nucleus of the library of the Tudor and Stuart Club, founded and endowed by him and Lady Osler at Johns Hopkins University in memory of their son.

His recently published catalogue contains an unfinished Introduction, entitled "The Collecting of a Library". It is a sort of bibliophilic autobiography, and from it most of what I have to say to you is abstracted.

Osler was fortunate in his teachers, W. A. Johnson of Trinity College School, James Bovell of Toronto, and Palmer Howard of McGill. They instilled into him not only the love of science but also the love of books. He recalls

with particular gratitude Bovell's excellent library in which he browsed freely during his two college years in Toronto. The best, he says, that the human mind had afforded was on Bovell's shelves, and in him all that one could desire as a teacher.

The first book he bought was the *Globe Shakespeare*, and he often invoked "the curses of Bishop Ernulphus on the son of Belial" who stole it. His second purchase was an 1862 Boston edition of Sir Thomas Browne's "*Religio Medici*." This was in 1867, when he was eighteen, and book and author became his life-long favourites. That particular copy, the father of the collection which McGill has inherited, went with him everywhere, and on his deathbed he scribbled in it in pencil this proud boast, "I doubt if any man can more truly say of this book, *Comes viae vitaeque* (companion on my life's journey).

During his fourteen busy years in Montreal there were cobwebs in his pockets, but he spent more time and money than he could afford in a nearly successful attempt to collect all Canadian medical and scientific journals. These he gave to the Medical Library when he left Montreal

in 1884. In Philadelphia he began to collect American medical classics—and to read them, for he was never merely a collector. In Baltimore, in the 'nineties, with a purse which might have bulged if he had ever tried to close it, he bought freely. Many of the old books were acquired at this period, especially editions of Vesalius and of Linaere, Harvey, Browne, and other English worthies.

Current books and journals were constantly passed on to friends and libraries to make room on his shelves. Book-sellers' catalogues appeared on the breakfast table and were always with him on railway journeys. In the summer holidays, usually spent in England, the old bookshops were his happy hunting ground. But it was not until after 1905 when he went to live in Oxford, a book-lover's paradise, that the present collection really took shape.

Let me quote his own words: "As the collection grew, plans for its disposition had to be considered. Already at the outbreak of the War my son, Edward Revere, aged 18. . . . had shown unmistakably the direction of his tastes, and it was agreed that he should take the works in general literature while the scientific books should go to McGill. . . . Though a wanderer, living away from Montreal for more than half my life, the early associations I have never forgotten. The formative years were there with the strong ties of head and heart. As a young, untried man, McGill offered me an opportunity to work and to teach, but what is more, the members of the Medical Faculty adopted me, bore with vagaries and aggressiveness"—aggressiveness is a word that could be applied to him only by Osler himself—"and often gave practical expressions of sympathy with schemes that were costly and of doubtful utility. That they believed in me helped to a

belief in myself, an important asset for a young man, but better had by nurture than by nature. Alma Mater, too, counts for much, and as a graduate of McGill I am proud of her record. Had I not seen the day of small things? Did I not graduate in the days of the Coté-Street school? I may quote Fuller's sentiment: 'He [Fuller's Good Bishop] conceived himself to hear his Mother College alwayes speaking to him in the language of Joseph to Pharaoh's butler, But think on me, I pray thee, when it shall be well with thee.' Then there is the natural feeling of loyalty to the country of one's birth and breeding. These are the considerations which decide me to leave the special collection to my old school at Montreal."

"As the books increased," he continues, "the hope matured into a scheme for a library which would have a definite educational value and a literary and an historical interest. To break a



collection into sections is hazardous, but I considered that, after all, this would form a special part of the Medical Faculty Library just as the latter is a section of the University Library." He decided, therefore, to follow his own plan and group the books in eight sections. The first section, which is the chief and original feature of his library and catalogue, he called *Bibliothea Prima*. It was planned to contain, in chronological order, and in a comparatively small number of works,—there are about 1,700 items in this section—the essential literature of the evolution of science, represented by the works and lives of sixty-seven authors who, in his opinion, were contributors of the first rank to science, beginning with Hippocrates and ending with the nineteenth century. He tried particularly to obtain the fundamental contribution in each subject, whether this was represented by a

great Aldine edition like that of Aristotle, or a three-page pamphlet of Röntgen.

The second and largest section, more strictly medical, contains the works of authors not classed among the outstanding pioneers. The third, called *Litteraria*, deals with the relations of medicine and general literature. The next three sections are History, Biography, and Bibliography, almost entirely modern books; the seventh and eighth are Incunabula and Manuscripts. Of the books printed in the fifteenth century, technically known as incunabula, he succeeded in acquiring 136, some of them with funds contributed for the purpose by his brother, the late Sir Edmund Osler. With the 30 or more incunabula already in the University Library, McGill is now rich in these artistic and historically interesting treasures.

"The Library," Osler wrote, "is for the use of students of the history of science and medicine, without any other qualifications, and I particularly wish that it may be used by my French-Canadian colleagues, who will find it rich in the best of French literature."

Before the War Osler had begun to give effect to what he called his "ambitious desire to prepare for printing a *catalogue raisonné*, with biographical and bibliographical notes." In 1919 he remarked that he needed ten years of not too senile leisure in order to complete both collection and catalogue to his satisfaction. *Dis aliter visum.* Before his death, at the end of that year, he requested that the catalogue should, if possible, be finished and printed before the books went to Montreal, and he named four editors, his bibliophile friend Mr. L. L. Mackall, of Savannah, Dr. Archibald Malloch, of McGill, now Librarian of the New York Academy of Medicine, Mr. R. H. Hill, of the Bodleian Library, and myself. That we have been privileged to carry out this labour of love we owe to the authorities of McGill, who were content to wait patiently for the books, and to Lady Osler, who whole-heartedly devoted the rest of her life to the task which, to our lasting sorrow, she was destined not to see quite completed. She died in August, 1928. Besides having financed the catalogue, she generously bequeathed £10,000 for the upkeep of the Library.

It is the intention, and it was Osler's wish, that the collection be added to and gaps filled, as funds and opportunity may permit.

The catalogue, entitled "Bibliotheca Osleriana", was published in May by the Oxford Press. It is a book of over 800 pages in large format, and has already been welcomed by those who know as a contribution of real value. It is fundamentally Osler's own work. The interesting arrangement of the books is wholly and the annotations largely his. It will always be useful to many who have not access to the library itself, and it may well continue to be quoted long after its author's other works are forgotten. As he himself once wrote, "There is no better float through posterity than to be the author of a good bibliography."

The Library was officially opened on May 29th, and those of you who have seen the beautiful room must agree that the University, the architect, Professor Nobbs, and the Bromsgrove Guild, have provided the books with a new home worthy of the gift. The books have been arranged on the shelves in the catalogue order, except his own writings and those of his favourite authors, Sir Thomas Browne, Burton, Rabelais, and others. These occupy the place of honour at the end of the room, in an alcove in the centre of which is a panel bearing his portrait in bronze; and behind that his ashes, as he desired, repose among his beloved books.

Thus is fulfilled in essence, if not in all its details, a hope he first expressed some twenty years ago in an unpublished paper entitled "The Burrowings of a Bookworm". It is written in his own hand, not by "William Osler", but by his other self, the equally loved if somewhat less reputable "E. Y. Davis". After discussing the fate of some great private collections he wrote this passage, which I may quote in conclusion: "I like to think of my few books in an alcove of a fire-proof library in some institution that I love; at the end of the alcove an open fire-place and a few easy chairs, and on the mantelpiece an urn with my ashes and my bust or portrait, through which my astral self could peek at the books I have loved, and enjoy the delight with which kindred souls still in the flesh would handle them."

## The Inaugural Address

AT THE

SIXTIETH ANNUAL MEETING OF THE CANADIAN MEDICAL ASSOCIATION\*

BY A. T. BAZIN, M.D.

*President, Canadian Medical Association,*

*Montreal.*

I DO not propose to inflict upon you any prolonged dissertation relating to the history of this Association or of medical progress in general. Having had now some few years' experience associated with the editing of our *Journal* I realize with what dismay many presidential addresses are received and with what trepidation the Editor uses the scissors and scoring pencil to reduce them to a readable size. But I do wish to express my deep gratification and appreciation of being thus honoured by my colleagues, an honour which I consider to be the highest in the gift of the medical profession of Canada. I pray that I may be granted the wisdom and strength to do what should be done for this Association by its President.

It has been borne in upon me during the past few months, and particularly during the last hectic weeks, when illness deprived our organization of workers holding key positions, that the duties required of the President-elect in organizing the Annual Meeting are not conducive to that state of mental quiet necessary to bring forth an address that would be worth-while. And I offer the suggestion that the President's annual address should be valedictory rather than inaugural. The year's experience in the office should make a powerful impression upon any man worthy of the post and he should surely have a real message to convey. So you will excuse me if I confine my remarks to a few disjointed subjects.

First, I wish to express my grateful appreciation to all those who have worked long and hard to make this meeting what it is on paper, and what we all hope it will prove to be in reality. Comparisons are odious, but I feel that I will hurt the feelings of none if I mention particularly in this connection Dr. Léon Gérin-Lajoie, Secretary of the Province of Quebec Medical Association,

whose unfailing zeal and energy have been invaluable. To the Government of the Province of Quebec, through the Honourable Athanase David, to the City of Montreal, and to others who desire to remain incognito, we owe generous support. To the Kiwanis Club and the Rotarians of Montreal we are indebted for the courtesy of abandoning the rooms of this Hotel in our favour. To our hosts and hostesses, and to many others whose names are almost legion we gratefully acknowledge kindness and hospitality. And to the contributors to our scientific program, especially to those who have travelled from afar, we are beholden in such manner as cannot be repaid.

This convention bids fair to be unique. In few places, if, indeed in any other city, can there be demonstrated side by side the methods and practice of two distinct schools of medicine, both pushing on toward the same goal, but by somewhat differing routes. The French school is faithfully mirrored in the Université de Montréal and the hospitals attached thereto. A large proportion of its teachers of Canadian origin are trained in France, whilst by a loan system the professors of the Faculties of Paris, Lyons, Strasbourg become for a period of years the actual teachers in this city. I wish to urge upon the members of Council, and through them upon the membership of the Association as a whole, the great desire of our French colleagues to demonstrate their work. Every teacher, almost without exception, is prepared to present or discuss his subject in your language as well as in his own.

In a mental survey in preparation of this address one topic especially obtrudes itself. You have in the agenda before you the resignation of our Editor, Dr. A. D. Blackader. We grieve that he is absent from among us, but we rejoice that he has weathered the storm of a recent severe illness. We are also privileged to be able to

\* Delivered before Council of the Canadian Medical Association, June 17, 1929.

convey to him our congratulations and felicitations upon the occasion of his eighty-second birthday on the 19th of June, two days hence. At an age when most men have laid, or are laying by one burden after another, Dr. Blackader, ten years ago, took upon himself, as a labour of love, what proved to be probably the heaviest and most exacting burden of his whole career. No one not intimately associated with him can realize what self sacrifice has been entailed, not only upon himself but upon Mrs. Blackader. We shall sorely miss his guiding hand, but trust that he will enjoy for many years to come the leisure for recreation and contemplation which the selfish needs of the Association have denied to him during the past decade.

#### THE ASSOCIATION

The Canadian Medical Association stands for unity in the profession of Canada. In different Provinces and sections we may approach that unity of purpose and ideals from different angles and along different roads, but our eyes are set upon the one goal. And therein lies our strength. In course of time it may be that the Association will embrace in its membership all the medical practitioners of Canada, but that time is not yet. Coercive measures will not achieve our purpose, nor will legislation enforcing membership be fruitful of good results. For the strength of the organization lies not in its numbers but in its activity. Better a "flivver" with "pep" than a steam roller with no steam. The latter sinks more and more deeply into its own ruts.

Our General Secretary informs me that this is the largest meeting of Council in the history of the Association. Nearly one hundred of you have hurried to this assembly. Not for pleasure are you voluntarily attending these business meetings, forenoons, afternoons, and possibly evenings. You have faith in the future of your Association, you have pride in past achievements. By your example, and that of your active committees throughout the year, will the religion of organized medicine gain converts from among those who have not yet seen the light.

#### THE POST-GRADUATE WORK

At no gathering of Canadian Medical Association members can this greatest of all achievements be passed by in silence. As this is the first meeting in Montreal since the inception of the work, we had hoped to have as our honoured guests to-day Mr. Macaulay and Mr. Wood,

that Council might have the opportunity to express to them in person the indebtedness of the whole profession of Canada and indirectly that of the community. But unfortunately for us that is not possible. Mr. Macaulay is across the seas on another errand of beneficence, and Mr. Wood sails in a few hours. The Post-graduate work is now in its fourth year and has gained such momentum that it cannot cease.

And whilst remembering the benefactors who made this possible we must also express our gratitude to those committees who unceasingly direct the work and to those who contribute so unselfishly in time and energy to disseminate their knowledge.

#### HOSPITAL SERVICE

In the short period of the life of this Department much more has been accomplished than appears on the surface. The Association is fortunate in the choice of Dr. Agnew as Associate Secretary in charge of this branch. He has approached the problems with no preconceived ideas, and is rapidly making headway in the rapprochement of divided interests.

There are three primary component parts of a hospital, the medical attendance, the nursing service, the financial and administrative problems. My own conviction, after many years' association with hospitals, is that the medical profession is the one party which requires, more than the other two, elucidation of the problems of hospital administration. I would like to see a Hospital Section of this Association holding its meetings regularly and discussing with representatives of the other two parties the problems that are constantly arising. If luxury in plant and equipment, if waste of supplies, were eliminated we would be well along the road toward reduction of expense to the patient. I look forward with eagerness to the presentation at Friday's session of Dr. Murphy's paper "The Duty of the Doctor to the Hospital"

#### HEALTH EDUCATION AND SERVICE

For more than a year our Association has been engaged in this work. For the results accomplished we are indebted to Dr. Grant Fleming who has voluntarily devoted much time to the preparation of these articles for the press. It is gratifying that the value of this service has been recognized and by means of a grant from the Life Insurance Officers' Association of Canada the work can be placed upon a firm basis and can be extended

in ways to make it even more productive of benefit to the community.

#### PERIODIC HEALTH EXAMINATION

As an Association and as individuals we are intensely interested in the health of the community. We are all of us, without question, anxious to prolong the *useful* life of every citizen. We believe that periodic health examination is a means to that end. Hence for some years we had a committee to evolve a system whereby the profession would be prepared to undertake the work when the demand arose. The manual and the forms were the result of this Committee's deliberations. That some have erroneous conceptions of the scheme is evident from correspondence and discussion. Hence the preparation of a moving picture film which will be presented by Dr. Martin at Thursday's session. Our primary duty is to educate *ourselves* to properly examine, assess, and advise these health candidates. The demand for this service must be spontaneous on the part of the client, or suggested by some other organization. That such a demand is imminent will be disclosed during this session of Council.

#### ROYAL COLLEGE OF SURGEONS OF ENGLAND

That this ancient and honourable body should have seen fit to entrust to our Association the organization of the Primary Examination in this country is a source of pride and gratification to us. That the privilege is appreciated by our young men is evident from the large number (30) of candidates who will present themselves next August. We are grateful to Dr. Primrose, who, as Chairman of the Committee, brought the negotiations to a successful issue. And Council should also be apprised of the fact that Dr. Primrose is cutting short his holiday in order to attend during the progress of the examinations.

#### ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA

For many years this problem has been the football of committees of this Association. Three years ago Dr. David Low took charge and at the meeting in Toronto in 1927 presented his arresting report. Thenceforth progress, though slow, has been steady, and Dr. Fred Starr is now able to report that the bill has become law. The elaboration of details is still necessary. The advantages accruing from this step will depend altogether upon the standard set at the beginning

and maintained thereafter. Here again there is no strength in numbers alone. The benefits sought apply not to us but particularly to those who follow us.

#### BRITISH MEDICAL ASSOCIATION AFFILIATION

Our bonds with the older Association become stronger, though no tighter. They are the bonds of sympathetic co-operation, not the shackles of control. We are privileged to welcome to this meeting two official delegates from the British Medical Association, and to their Manchester meeting next month we delegate a number of our own members.

But any reference at this time to the British Medical Association is completely overshadowed by the imminence of the meeting in Winnipeg. I do not propose in the slightest degree to "steal the thunder" of our Winnipeg friends, but we wish to assure them that this Association has every confidence in their ability and determination to provide a meeting next summer which will go down in the annals of both Associations.

#### THE NURSES

Two weeks hence Canada—and Montreal—are to be honoured by entertaining the International Congress of Nurses. Members of this Association have received a cordial invitation to attend any and all the sessions. The anticipated registration approximates seven thousand. I mention this to demonstrate that nurses the world over are in anxiety and unrest concerning their problems, particularly those of training and education. We have had, and still have our own problems as regards medical education. But our task is rather easier than theirs, as they must consider so many interests other than their very own. Inasmuch as the work of the nurses is so closely linked with our own, I am convinced that we can be a factor in assisting them in their studies. To this end our Association has had a Committee at work for two years, and I can assure you that the interest thus manifested is welcomed most heartily by the Canadian Nurses Association.

#### GOVERNMENT RECOGNITION

At various times and in different ways this Association has been approached by the Federal Government. This spasmodic recognition has now culminated in the very desirable appointment to this Council of a medical representative

of the Minister of National Health. To this end you will be asked to amend the Constitution in such manner as recommended by the Committee in charge.

You will note that I have touched upon only those activities of the Association which are concerned directly or indirectly with improving or enhancing the value of the profession to the community. In my opinion these are the only ones really worth while, the only ones which will result in real progress and real growth of the Association. I have attempted as it were to hold a mirror before you—to see ourselves as others see us—to impress upon you these facts:

1. We are honoured by having as Patron, His Royal Highness, the Prince of Wales.

2. We are recognized by the Government of Canada as co-workers with the Minister of Health.

3. We are entrusted by responsible corporations with the administration of large sums of money in the interests of the health of Canada.

Does not all this indicate that we have reached adult stature and have assumed the responsibilities of grown men?

And I close these rambling remarks with a challenge and a pledge—Gentlemen—To Work and to Service!

### An Address

ON

#### THE SUDDEN ONSET OF LUNG TUBERCULOSIS IN THE ADULT AND ITS LOBAR LOCALIZATION\*

By E. RIST, M.D.,

*Paris, France*

WE have all been taught that the onset of pulmonary tuberculosis in its usual form is generally an insidious and slow one. This was in accordance with the commonly held opinion that, anatomically, consumption begins with one or a few microscopical tubercles located in the apex of a lung, and that from this initial and very small lesion the disease gradually extends centrifugally, new tubercles being formed in the neighbourhood of the primitive ones, the bacilli being carried away from the primary focus through the lymph-channels. This theory was based mostly upon the very painstaking and accurate study which had been made of the manner in which experimental tuberculosis develops from the site of inoculation in the guinea-pig. It received also some support from post-mortem examinations, made on persons who had died of a disease other than consumption and who were found to be the bearers of an occult, latent and very limited form of tuberculosis. And there was, furthermore, I may add, much in it which seemed in accordance with the old,

traditional opinion which considered consumption as a constitutional, mostly hereditary, disease, an opinion which of course Villemin's inoculation experiments and Robert Koch's discovery of the bacillus had made quite impossible to hold, but which, even in our days, has not yet quite ceased to influence, more or less unconsciously, the medical mind.

Viewed from the clinical point of view, this theory implied that the transition from a condition of unimpaired good health to disease went on almost insensibly, tuberculosis in its early stages being a slowly creeping disease, producing symptoms and signs only when it had, from initially minute lesions, extended and progressed to a sufficient degree. Therefore, all the skill and keenness of the clinician were directed towards the detection of the earliest possible signs a still minute lesion might give. I shall not attempt to describe nor to criticize all the niceties of percussion and auscultation which were supposed to enable us to ascertain the presence in a lung apex of a small cluster of fresh, newly formed tubercles developing after contagion had taken place, in people who had no definite symptoms or no symptoms at all. These transcendental steth-

\* Delivered at the Sixtieth Annual Meeting of the Canadian Medical Association, Montreal, on June 21, 1929.

acoustics, to which the names of Grancher, of Turban, and Gehrhardt are attached, and to which most of us adhered so reverently in their youth, have proved on the whole very disappointing.

When the x-rays were discovered in 1894, it was thought by many that they would be more powerful than our ears to detect those minute initial lesions of incipient tuberculosis. But the x-rays either failed to show us any alterations in the lung—and it was a triumph for the clinicians who prided themselves in making them out by percussion and auscultation—or they showed extended, often excavated, lesions involving a third or a half of a lung, in cases which the clinicians regarded as incipient or only suspicious, and it was the turn of the radiologist to feel elated. Of course there were also peacemakers who endeavoured to find a conciliatory ground, and one began to attribute confidently all sorts of ominous meanings to harmless hilus and peribronchial shadows. These were the palmy days of so-called peribronchial tuberculosis, creeping silently from the hilus to the apex, a very agreeable theory indeed, but which unfortunately no post-mortem was ever able to confirm.

During that period, which, I am afraid, is not quite over, the x-rays proved a diagnostic failure, not because they really failed to show us things as they are, but because we insisted upon them showing us things as we wanted them to be, and this they could not do. As soon as this objectionable, but after all not unnatural, position was abandoned, and we candidly expected the x-rays to show us things we did not know, they rewarded us with a great deal of new and valuable information.

Pirquet's momentous discovery of the skin tuberculin test, in 1908, gave a quite unforeseen turn to our diagnostic cogitations. At first it was believed that it would simplify to a considerable degree the detection of incipient tuberculosis. You know that it did nothing of that kind, at least as regards incipient tuberculosis in the adult. Its properly diagnostic applications are limited to infancy and early childhood. In the case of the grown-up men and women it cannot help us diagnostically, because it is positive in the greater majority of them. But it has taught us something which is of much greater value than a mere diagnostic

procedure, namely, to discriminate sharply between tuberculous *infection* which, acquired in childhood and adolescence, is almost universal among the adults living in civilized urban communities, and tuberculous *disease*, which affects only a small minority out of them and as a rule is not co-incident with primary infection.

The diagnostic problem in the adult does not therefore rest upon making out the earliest possible lesion following the first introduction of tubercle bacilli into the respiratory tract. This is an affair long foregone and concerns the paediatrician. Our problem is now quite different and may be expressed in the following words:

An adult having a positive skin test, and, accordingly, bearing an old primary inactive focus of tuberculosis, which during a long period of time has kept him resistant to tuberculous disease, becomes under certain circumstances deprived of such resistance. A change has occurred in his allergic condition. Be it that it has suppressed the check put on the multiplication of the bacilli acquired by him on the occasion of his first infection, or be it that a new infection from outside has overtaken him in a state of anergy, a question in which I shall not enter to-day, the fact is that he begins to react to infection by disease. An active lesion takes place in the lung, and is manifested by general and functional symptoms. From a healthy he is turned into a sick man. Now, how does this change from health to disease show itself, by what symptoms and what signs? How shall we be able to recognize it?

The classical and traditional opinion according to which tuberculosis begins insidiously in the adult and, during its early stages, progresses very slowly, has no doubt some truth in it. But it is a limited amount of truth, which applies only to a limited proportion of real facts. We all have met the type of patient our text-books so complacently describe; a man who, at first, experiences nothing more than feeling more tired than usual after his daily work, eating his meals with less appetite, losing weight slowly, and who finally becomes concerned with a little coughing which began he does not know exactly when or how; he may have a slight flushing of the cheeks in the evening and some night sweats. After having paid no attention to it for weeks or months,

and perhaps prompted by an occasional blood-spitting, he consults a physician who finds the physical and x-ray signs of a very limited infiltration in an apex.

But we will more frequently, if we know how to look for him, meet an early consumptive of a very different type. I think I can best convey to you what I mean, by giving you one or two histories:

#### CASE 1

R. F., a medical student, aged 21, came to consult me on June 3, 1921, under the following circumstances. In perfect health, working hard at the medical school, and at the same time very fond of sport and physical exercise, rowing and foot-ball especially. He entered military service, which as you know is universal and compulsory in France, on October 2, 1920. He was first assigned to a cavalry regiment in Paris, and after some time transferred to an infantry regiment, also in Paris. Facilities were given him for keeping up his medical studies to the extent of their being compatible with his military duties. He took the best advantage he could of these facilities and passed successfully several examinations at the medical school, doing at the same time hospital work as a clerk. I insist upon these details, in order to show that he lead a very strenuous life and stood it very well, keeping in good form and complaining of no fatigue whatever. During that whole period he was submitted to six routine medical examinations, on his enlisting into the army, on his entering the cavalry regiment, on his entering the infantry regiment, again previous to typhoid inoculation, and on two other occasions. These six examinations, some of which at least, we must admit, were conducted very thoroughly, found him in perfect health. He himself asserts quite positively that he had had no symptoms of any kind and felt altogether fit. Since entering the army his body-weight had dropped from 71 to 69 kilos, a loss of 2 kilos, which, given the very active life he had to lead, can certainly not be regarded as abnormal.

On May 25, 1921, he went with his regiment for a military march of 25 kilometers. On the next day he played a game of football, during which he suddenly felt bad, fell to the ground and swooned. On the 27th he felt exceedingly tired and was kept in bed at the regimental infirmary. The medical officer noticed that he was expectorating a little, examined his sputum and found that it contained tubercle bacilli. His temperature was over 40°C. As his father, who is a chemist, lived in Paris, he was immediately sent home, where he went to bed. The temperature gradually went down; on June 2nd it was 38.2°C. He felt much better. His father brought him to my office the next day, June 3rd.

I found dullness and a suppressed vesicular murmur in the upper third of the right lung with some crackling râles. Looking at his chest with the fluoroscope, I saw a condensation of the whole upper right lobe, sharply limited inferiorly by the interlobar fissure, underneath which there was no abnormality to be detected. A film was taken the next day; it confirmed that the condensation was a lobar one, and gave us the additional information, that in the centre of it, underneath the clavicle, a cavity, about the size of a walnut, had formed. The left lung was sound. On June 6th, I performed an artificial pneumothorax, which gave an excellent result and ultimately led to complete recovery.

Here, therefore, we have a young man whom we have every good reason to consider as having remained in perfect health until May

26th. On that same day, he suddenly falls ill, and, after less than a week, he is found the bearer of a tuberculous lesion extending to a whole lobe, with a cavity, and with bacilli in his sputum. When he came to see me, on the 7th day of his illness, the acute symptoms, fever, malaise, had disappeared; he felt much better and his sputum had begun to diminish.

Of course, it may be objected that his good health previous to May 26th was only a delusion. It will, perhaps, seem to many almost incredible that lesions may have extended to a whole lobe and undergone cavitation in such a short time. And yet the arguments in favour of his lungs having been sound until the first day of his feeling unwell are very strong. But let us admit the objection, provisionally at least. How then shall we account for the following story?

#### CASE 2

S. G., a girl of 20, was employed as an orderly nurse at the Seaside Hospital for bone and joint tuberculosis at Berck-sur Mer. She was well and complained of nothing. On May the 30, 1925, she underwent a routine medical examination prescribed as a preventive measure for all the personnel of the hospital. The physician in charge, an able and experienced man, whom I know personally, found her lungs all right on the fluoroscope as well as by physical examination, and pronounced her in good shape. A fortnight later, waking up in the morning, she was suddenly seized with a sharp pain in the left side of her chest, under the clavicle, which caused her to breathe with difficulty. She had several chills, and the same evening her temperature was 40°C. She began to cough and expectorate. She remained in bed, feeling very bad and exhausted. The temperature kept high during several days; she had night sweats, and lost weight rapidly. Her sputum, which was thick and yellow, contained tubercle bacilli. On the 8th day she was examined under the fluoroscope, which showed a dense shadow covering the whole of the upper lobe. She was without delay transferred to my department at the Laennec Hospital in Paris, where a skiagram was taken less than one month after the first day of her illness. It showed a large cavity under the clavicle, in the midst of a dark condensed upper left lobe. The physical signs were in accordance with the information given by the x-rays. The right lung was sound. An artificial pneumothorax was successfully performed.

Here we have, thanks to the competent fluoroscopic examination made a fortnight before the onset, positive proof that the lung was sound, perfectly transparent, when these extended and excavated lesions developed with such dramatic suddenness. It requires undoubtedly rather fortunate circumstances to bring it about that a complete physical and radiological examination should be made of an individual one or two weeks before he suddenly falls ill with consumption. Thanks to the

great number of prophylactic examinations which are conducted at my dispensary consultation (a fluoroscopic examination being always included) among the contacts of our tuberculous patients, the chances of such circumstances originating are increased, and, of course, we take advantage of them. I have even had the good luck to procure in some cases not only a fluoroscopic examination, but, what is still better, an x-ray film demonstrating the normal condition of both lungs a few days previous to the unexpected onset of an extended tuberculosis similar to the type of which the two cases just mentioned are an illustration.

What a striking difference there is between this type of onset and the traditionally described one! And how little is it in accordance with the teaching we have received concerning the anatomical evolution of pulmonary tuberculosis in the adult! The first question we should ask ourselves is as to what kind of tuberculous lesions these rapidly extended and excavated condensations represent. We shall have to discuss hereafter whether such cases with sudden onset and large involvement are exceptional and consequently of small practical importance, or whether, on the contrary, they are a frequent occurrence, and for what reason they are generally misunderstood and overlooked.

To the first question it is, I think, easy to give a satisfactory answer. Since the days of Laennec, the French school of pathologists has repeatedly and persistently insisted upon the fact that, alongside with true tubercle, one always found in the lungs of consumptive people patches of pneumonic lesions of the inflammatory type, which belonged just as truly to tuberculous disease as tubercle itself. Virchow and his school objected to this, holding that the pneumonic, inflammatory infiltrations which one found in tuberculosis, although they could in their turn be invaded by tubercle, were primarily unspecific. The controversy lasted long, and only had its end when Koch's discovery made it clear that the pneumonic type of lesions was due to his bacillus as regularly as the follicular type.

But, up to recent times, the Germans attached little importance to those inflammatory lesions, whereas the French always laid great stress on them, in their theories of phthisio-

genesis. The Lyons school,<sup>1</sup> with Tripier at its head, was foremost in the investigation. Tripier, at the International Congress on Tuberculosis, held in Washington in 1908, went so far as to say that inflammatory alveolitis of the pneumonic type was the primary process in lung tuberculosis and that it always preceded the formation of true follicular tubercle, which developed only secondarily.<sup>1</sup> More recently Bezançon and Braun,<sup>2</sup> Rénon and Géraudel,<sup>3</sup> Burnand,<sup>4</sup> Letulle,<sup>5</sup> Ameuille and myself<sup>6</sup> supported his views with new facts and arguments. May I add that we felt some surprise and had no small amusement when we saw this doctrine, which we had been so long familiar with in France, suddenly revealed to the world as something unheard of, when, a few years ago, the German pathologist Aschoff made it his own and described the follicular lesion as "productive" and the pneumonic lesion as "exudative."

It is clear that the massive lesions so rapidly developed in the lungs of the two patients whose history I have been giving belong to the pneumonic or, if you prefer, to the exudative type. What is difficult to understand is why the anatomical notion of pneumonic tuberculosis should have been so slow to be converted into a clinical notion. Yet, as early as 1829, the French clinician Andral<sup>7</sup> professed that "one has not seldom the opportunity to observe consumptives, who, during the course of their disease, have presented twelve or fifteen times undisputable symptoms of pneumonia." Some twenty-five years later, Lorain asserted that "chronic pulmonary tuberculosis was nothing short of a succession of pneumonias." Bezançon and his pupils Braun and Brunel de Serbonnes<sup>8</sup> have in 1911 and 1912, and repeatedly since, drawn attention to the fact that the course of events in consumption is characterized by a series of acute pneumonic attacks separated by more or less prolonged intervals of quiescence, and they made a very complete anatomical and clinical study of these acute phases.<sup>2</sup> They, as well as Orsat and Savy (of Lyons), Burnand (of Leysin), and others repeatedly endeavoured to impress the minds of their readers with the idea that the greater number of acute inflammations of the lung which are not definitely lobar pneumonias due to the pneumococcus, and which go under the

names of pulmonary congestion, influenza, dry pleurisy, etc., are really acute phases and sometimes the initial phase of chronic consumption.

But in the general medical mind, the association of the words "acute" or "pneumonic" with the word "tuberculosis" almost invariably evokes the idea of that rare and deadly disease, caseous pneumonia. It is true that pneumonic tuberculosis incidentally may evolve into massive caseation, but this is an exceptional occurrence. The ordinary course of events in tuberculous pneumonia is quite different. It may be absorbed completely without leaving any trace, except perhaps some calcified nodules. Generally, the absorption is not complete, and parts of the condensed patch are converted into more specific-looking and more permanent lesions; fibro-caseous nodules, cavities, diffuse fibrotic conditions. The partial regression and transformation may follow very rapidly the acute pneumonic episode. Symptoms become reduced to a minimum or even practically disappear. A phase of quiescence begins, the duration of which may vary considerably, until a new acute episode intervenes.

For my own part, I have long held the opinion that the pneumonic incidents not only marked the successive stages of the progress of the disease, but also characterized its incipiency, and that this was likely to be the reason why physical examination and x-ray examination were not able to agree in disclosing to us the initial stage of consumption as it is described in our text-books. Tuberculosis experts in dispensaries and sanatoria have always been complaining that patients were sent to them too late, when their lesions were already far advanced, and there is still a great deal of justice in their complaints. But they are mistaken nevertheless, when they hold that a tuberculous lesion covering a large area of the lung, and excavated, must of necessity be an old far-advanced lesion. It may be a lesion a few days old, as in my illustrative cases, and it is by no means certain that six months or a year hence-forward such a lesion will have notably extended.

I have expressed those views in a paper which I published in 1916 and from which I may be allowed to quote the following sentence: "Tuberculosis sets in like a pneumonia, and all of a sudden takes hold of one-half of a lobe or

of an entire lobe<sup>9</sup>." Later, in 1921 and 1922, my friend Dr. P. Ameuille and I reverted to this question, and we gave a detailed description of the initial acute pneumonic stage of lung tuberculosis.<sup>10, 11</sup> Our conclusions may be summarized as follows: "The first stage of pulmonary tuberculosis in the adult is always made up of a pneumonic attack, the lesion being generally rather extended from the beginning and showing a very early tendency to ulceration. It may occupy the whole of a lung lobe, a few days and even a few hours after the onset. We do not pretend to say that there may not be also pneumonic lesions which involve only a small area of lung tissue, but it seems as if such small lesions are hardly able to determine clinical symptoms and will rapidly become quiescent and abortive. . . . The initial pneumonic lesion may eventually be totally absorbed, in some rather exceptional instances. Generally, it is only partly absorbed, leaving behind it lesions which undergo the ordinary evolution of tuberculosis. . . . The initial lesion may become entirely caseous, in some cases which then represent true caseous pneumonia. It is seldom that we find this caseous stage at the post-mortem in adults, because it seems to be short-lived. Indeed x-ray study of the initial stage of tuberculosis in adults shows how rapidly the tuberculous lesions are excavated; it takes a few days, even a few hours, so that there is hardly any space left for an intermediate stage of caseation. This is probably the reason why sputum appears so early and why bacilli can be found in it almost from the beginning. Generally speaking, a limited area of the pneumonic patch only becomes excavated, but it may happen also that the whole of it is converted into a cavity."

Let us now try to find out whether the sequence of anatomical processes which we have just mentioned has its ordinary counterpart in clinical histories such as I have reported. Those sudden onsets, marked by fever and often by chills, are hardly taken notice of in the text-books, which all tell the stereotyped tale of insidious and slowly progressive incipiency. But when I formed the habit of cross-examining my patients with a view of finding out which had been the precise circumstances marking the onset of their disease, and exactly how they had ceased to be healthy individuals having their

full capacity for work, I was surprised to see how often I came across histories of a sudden acute onset. I asked successively two members of my staff to make a survey of that kind. Dr. Dudan<sup>12</sup> in 1925 took the complete history of 100 consumptives (50 male and 50 female) in the chronological order of their admission into my department. Dr. Blanche<sup>13</sup> in 1927 made a similar inquiry on 200 consumptives (100 male and 100 female). Their results fell very much in accordance. Here are Dr. Dudan's figures:

	Per Cent
Insidious onsets .....	34
Hæmoptoic onsets .....	6
Sudden onsets preceded by light prodromal symptoms .....	12
Sudden onsets without prodromal symptoms .....	48

And here are Dr. Blanche's figures:

Progressive onsets .....	37
Hæmoptoic onsets .....	13
Sudden onsets .....	50

Under the term "progressive onsets," Dr. Blanche distinguishes on one hand genuine insidious onsets which represent 44.5 per cent of the progressive class and 16.5 per cent only of the total, and on the other hand rapidly and regularly progressive onsets which are a kind of intermediate class between the truly insidious and the sudden, and probably can be put alongside with the cases which Dr. Dudan calls sudden onsets with slight prodromal symptoms. It must further be remarked that a certain proportion of hæmoptoic onsets really belong to the sudden type, that is to say, when hæmoptysis coincides with the ordinary febrile and acute symptoms of the sudden onset. Anyhow, in each of those statistics, sudden onsets clearly predominate. They represent one-half of the cases at least and more than one-half, if one takes into account my preceding remarks.

The sudden onset may affect a variety of clinical features, which may be conveniently classed under the four following heads:

1. In a large number of cases, it has the appearance of an *acute pulmonary or pleuro-pulmonary episode*. Chills and fever initiate it, the fever being generally high, occasionally very high. Pain in the sides, coughing, expectoration, are always present; the sputum may be rusty, as in ordinary lobar pneumonia. Physical signs are the same as in lobar pneumonia; dullness or flatness, tubular breathing and crepitant râles. But it is a kind of pneumonia which either

aborts after two, three or four days, or on the contrary drags on much longer than the classical nine days, becoming meanwhile more or less atypical.

The clinical picture may also, from the beginning, differ more or less from true lobar pneumonia and is then identical with those ill-defined syndromes which go under the names of pulmonary congestion, grippe, spurious bronchopneumonia, dry pleurisy, and so on.

On the whole, the cases in which acute symptoms of lung-involvement occur make up for one-half of the sudden onsets, or 25 per cent of the total in Dr. Blanche's statistics.

2. In a lesser proportion of cases, namely 12 per cent, the onset is marked by symptoms closely similar to those of an *acute catarrh of the upper air-passages* and goes under the name of an ordinary febrile cold or of an attack of "flu"; coryza, sore throat, rhino-pharyngitis, catarrhal laryngitis, tracheo-bronchitis. When the cold is over, there remains a persistent morning cough with a very moderate amount of sputum, and the patient goes on feeling a little out of sorts, running a slight evening temperature, and losing weight.

3. In a very small proportion of cases (1.5 per cent) the symptoms point in no way at first to a respiratory disease. The sudden onset of *fever is accompanied by digestive troubles*; pain in the stomach and intestine, nausea, vomiting, diarrhoea. One thinks of typhoid or food-poisoning. After some days only, coughing sets in and draws attention to the chest.

4. And, finally, we have 11.5 per cent of our sudden cases in which *chills and fever*, loss of strength, muscular pains and malaise are at first *accompanied by no symptoms pointing to any localization at all*. There is neither coughing nor gastro-intestinal disturbance. The fever subsides generally before any precise diagnosis can be made and the whole occurrence is attributed to influenza. But if a complete examination is made at that stage it will often lead to the discovery of extended and already excavated lesions in one lung.

Such are the most usual clinical features which characterize the sudden onset of lung tuberculosis in the adult. If one has the opportunity to make a physical examination of the chest of the patient during that early stage, the signs of pulmonary consolidation are sometimes quite

evident; dullness, impairment or abolition of the vesicular murmur, bronchial or tubular breathing, crepitant or sub-crepitant râles. But the physical signs may be more doubtful, and sometimes even there is really nothing abnormal to be heard. It all depends on the localization of the pneumonic lesion. If it is near the surface of the lung and within reach of the stethoscope and the percussing finger, there is no difficulty. But when it is deeply situated, or adjoining the shoulder joint, it is bound to escape even the most expert stethacoustic examination, whereas an x-ray examination will infallibly discover an extended and often already excavated lesion. And if there is any sputum, bacilli will be discovered in it.

The first stage with its sudden onset may be followed almost immediately by the classical symptoms of manifest phthisis. But it is generally not so. In most instances what takes place after the acute onset is a phase of quiescence or semi-quiescence, which has the rather unfortunate effect of appeasing the anxieties of both the patient and his physician. Fever has subsided, appetite comes back. One speaks of convalescence and even of recovery. The acute episode is checked under one of those uncompromising and misleading heads which are the cause of so many mistakes in diagnosis. There has been no thought of tuberculosis. And yet some very slight symptoms persist, the most constant of them being a little morning cough followed by a very reduced amount of expectoration, so reduced indeed that some patients do not take the trouble of expelling it. Although strength has more or less been restored and work has been resumed, they are easily tired and lack energy. "Since I have had this attack of 'flu', or whatever it may be called, I have never felt quite the same man as before." This one commonly hears from the mouth of such patients. During that phase, the pneumonic lesion has entered a period of shrinking and fibrosis. The solitary cavity or the more or less numerous small cavities which have been formed through the necrotic process of the initial pneumonic phase have emptied their contents and now produce only scanty secretion. This can remain so during several weeks or several months. It can even lead to ultimate healing, the cavity becoming smaller through shrinkage, and undergoing a process of repair. But as a rule this quiescent

phase is sooner or later followed by a renewal of illness, be it that more manifest symptoms and signs of consumption progressively develop, or be it that a new acute episode, more or less similar to the first one, intervenes.

Now let us go back to the initial incident, occurring in perfect health, so suddenly indeed that the tuberculous patient, if properly asked, is often able to say "I fell ill on such and such a day, at such and such an hour." It is, as we have seen, the x-ray examination which enables us to diagnose it with certainty. How then do these pneumonic lesions appear on the fluoroscope or on the film, when they are discovered at their onset?

You may have noticed that, speaking of them, I often used the expression "lobar lesions," "condensation of one whole lobe or of one-half of a lobe." As far back as 1916 I pointed to this usually *lobar* localization of incipient tuberculosis. Since then, and more especially in the years 1921 and 1922, I have endeavoured, in co-operation with my friend Dr. P. Ameuille to make a more detailed study of these lobar localizations which had not as yet attracted attention.

It is a well known fact, demonstrated some thirty years ago by M. A. Béclère, that the interlobar fissure, which normally is invisible on x-ray films, can be made to appear when it has become thickened as a consequence of some inflammatory process. If the tube is so placed that the normal incidence of the rays goes through the entire length of the fissure, which has an oblique direction from up backwards to low forwards, the thickened fissure will give a straight linear shadow. Now the fissure is commonly thickened in pulmonary tuberculosis, as post-mortems readily show. When the lesions, as is the rule, predominate in the upper lobe, the autopsies show, furthermore, that it is not only thickened but displaced and deformed. The displacement is from downwards upwards, owing to the fibrotic shrinking of the diseased upper lobe, and it may drag the fissure to a very high level. The deformation converts the plane flat surface of the fissure into a dome-shaped surface with its convexity turned upwards. This is brought about by the fact that the shrinkage process is more pronounced in the central than in the peripheral parts of the lobe. Also, adhesions must be taken into

account which fix the lateral end of the fissure to the chest wall and therefore prevent the ascending movement of the fissure from being evenly distributed. Both displacement and deformation of the fissure are seen very frequently and very distinctly on the fluoroscope in cases of pneumonic tuberculosis such as I have described. If displacement predominates, one generally sees on x-ray examination a marked condensation of the greater part of the upper lobe with a sharply defined inferior limit. This limit is straight; its medial end corresponds to the upper part of the hilus; its external end is more or less high up in the axilla, sometimes adjoining the shadow of the clavicle. If deformation predominates, the sharp inferior limit is shaped like an arch, the convexity of which is directed towards the condensed upper lobe. This is how it is seen on front view, and may be called the frontal incurvation. But there is also a sagittal incurvation of which we become aware by examining our patient sideways in a profile view. It has the shape of a long drawn curve uniting the upper posterior to the lower anterior chest wall. Its convexity is also turned upwards. If one figures the way the normal incidence the x-rays must take from back to front in order to bring about the shadow of the fissure, it is easily understood that the fissure being curved, the rays traversing tangentially the convex part of the curve which is nearest the horizontal will cast a definite shadow underneath which condensations will show, as if they belonged to the lower lobe, whereas they really belong to the antero-inferior part of the upper lobe. If, therefore, the x-rays show us an upper lobe which is condensed and shrunken with a sharply defined curved inferior limit, and if we see underneath it the shadows of condensed pulmonary foci, it does not necessarily follow that the process has extended from the upper to the lower lobe. It may just as well be entirely confined to the upper. A profile view will help us in discriminating between both possibilities.

Now, my point is that in the greater number of patients whom we have an opportunity to x-ray soon after a pneumonic onset, we find that the involvement is *lobar* in its localization. The lobe may be condensed entirely. Often, one-half or two-thirds of it only are affected, but then the part of the lobe which remains

free is generally the apex. The rule is that the condensation shows evidences of lobar limitation, the sharp outline of the fissure making the demarcation. This means that the tuberculous lesions of the initial episode are not located on either side of the fissure; they do not trespass over the interlobar frontier. The inferior lobes at this stage are entirely devoid of any lesions. X-ray examination during life shows this clearly. Autopsies are exceptional at this stage of the disease, but when it happens that the patient dies during this first episode, the clear-cut limitation of the lesions to the upper lobe can be demonstrated post mortem. Furthermore, if one applies to such cases pneumothorax treatment at once (and I think it is the proper thing to do) one is often enabled to make out beautifully on the fluoroscope, or on the x-ray film the striking contrast between the diseased, collapsed, shrunken, utterly dark, upper lobe and the perfectly transparent sound lower lobes. If the fissure is not adherent (and often, though thickened, it is not) one may even see an open gap between the two lobes.

The lobar limitation of the tuberculous lesions will generally be overlooked, if one satisfies oneself with films taken according to a standardized technique, applied indiscriminately to all the cases. If, on the contrary, the film is taken only after a preliminary fluoroscopic examination which enables us to choose the position of the tube which shows best the fissural limit, one cannot escape noticing it. In most French tuberculosis centres, fluoroscopy is considered as an essential component of very routine physical examination of the chest; and it is probably the reason why the findings which Ameuille and myself have demonstrated were so readily confirmed by many French observers, especially by Prof. Léon Bernard and Prof. Sergent who made valuable contributions to that question. Prof. Léon Bernard even coined the name "lobitis," which soon became a pass-word among us, to designate this special form of tuberculosis, with which we have become familiar during the last eight years at least.

Lately, since 1925, and especially in the last two years, German literature has been discussing widely (and I am sorry to say, without any reference to the earlier French researches)

what they call "infra-clavicular infiltration" or early infiltration with sudden onset or also "Assmann's focus," from the name of the German clinician who they claim discovered it. They very appropriately consider these infra-clavicular infiltrations to be the most ordinary initial form of common chronic consumption. They describe them as being extensive from the beginning, precociously excavated, belonging to the exudative or pneumonic type, and in sharp contrast with the strictly apical, productive lesions which run a slow, torpid, and ordinarily benign course. It is indeed noteworthy and gratifying to see the German school arriving independently at an idea so much like ours about the real nature of incipient tuberculosis. There are only two objections to be made regarding their description of the infra-clavicular infiltration. Firstly, the notion of it originated not in Germany, but in France, and therefore it does not deserve the name of "Assmann's focus;" and, secondly, they have missed what is, in my mind, a very important feature of the whole complex, namely its lobar character. If they had looked at it more closely, they would have seen that what matters really is not whether the apex is or is not involved, but whether there is or is not interlobar limitation. There are, as I said before, condensations of the entire upper lobe, apex included. There are also condensations which affect only the inferior part of the lobe adjoining the fissure. And, finally, in exceptional cases the condensation is limited to the median right lobe or to one of the inferior lobes. All of them belong to the same type.

What is true in a general way is that these extensive or partial forms which are due to the pneumonic, exudative type of tuberculosis contrast with the slight nodular (or if you like exudative) forms, which ordinarily affect the apex only. It is often exceedingly difficult to make out the onset of the latter, because they are anatomically and clinically insidious. They are quiescent for prolonged periods, remain unchanged for years, have a natural tendency to spontaneous healing and calcification, and do not much endanger life. The lobar pneumonic form, on the other hand, has a sudden onset and represents the most common beginning of chronic consumption. Their course is characterized by a succession of more or less

acute attacks, each of them being the symptomatic expression of a pneumonic lesion invading a new territory of lung tissue. If such forms are not arrested in time by some procedure of lung collapse, they sooner or later lead to death. This, of course, is only a schematic outline and should not be taken as absolute rule. Nodular apical lesions may be occasionally the origin of an acute lobar process after having remained quiescent during a long period. Conversely, typical lobar processes may eventually take a favourable course and heal completely without the aid of artificial collapse. And finally, as Dr. Ameuille and I have pointed out, the most typical nodular lesions are probably the outcome of small, limited and abortive pneumonic (or exudative) lesions.

Neither can one say that the type of clinical onset invariably represents a definite type of anatomical onset.

If you read Dr. Blanche's book you will see that his clinical histories of sudden onsets are generally accompanied with a radiogram showing a typical lobitis. And yet there are some of those typically lobar films which belong to histories of a progressive or insidious onset. Also, one may see sudden onsets with lesions not extensive enough to deserve the name of a lobitis. Furthermore, it is not always possible to find out the real features of the onset in patients with a poor memory or a poor intelligence. And finally a radiogram may be misleading as to the presence or absence of an interlobar limitation, if it has not been taken after a careful fluoroscopic examination.

The following figures given by Dr. Blanche must, therefore, be regarded as giving only an approximate idea of the real facts. Among 200 tuberculous patients which he studied under my guidance, 107, or 53.5 per cent, had massive lesions with a sharp interlobar limit; 71 in the upper right lobe, 34 in the upper left, 2 in the lower left. On the other hand, 64 per cent of the sudden onsets had a lobar type of disease. For my own part I am convinced that the correlation between the lobar lesions and the sudden onsets will come out more and more distinctly from more extended statistics, taken with due consideration of the facts which I have been trying to describe.

Such correlation we can even find in the data published by observers who had not clearly

understood that the extended lesions with sudden onset are lobar in their localization. For instance, let us take the statistics recently published in a paper by Douglas, Pinner and Wolepor,<sup>14</sup> of the Detroit Municipal Sanatorium, inspired by the German idea of infra-clavicular infiltration with no reference to its lobar character, they have studied 200 patients and found among them 52 per cent with sudden onsets, a figure strikingly in accordance with the 48 per cent of Dr. Dudan and the 50 per cent of Dr. Blanche. The American writers, after a very minute and painstaking analysis of their statistical figures, conclude as follows: "Progressive and destructive pulmonary tuberculosis usually begins suddenly, with *exudative subapical* lesions. Strictly apical productive tuberculosis is not, as a rule, the incipient stage of progressive and destructive pulmonary tuberculosis. It may precede the latter, but even in such cases the latter starts usually as stated before. The rôle which apical tuberculosis plays in phthisiogenesis is rather insignificant as compared to that of subapical acute infiltrations. Lesions far advanced as to extent, and excavations, frequently develop within less than six months. Processes leading to active progression and to excavation are most frequently associated with acute symptoms. Apical involvement is, in the majority of patients, not an occurrence of incipiency but a late development. Diagnostic and therapeutic endeavours must be directed primarily toward the acute subapical processes and not toward the insidious apical disease.

Physical signs and symptomatology, traditionally described as characteristic for "incipient pulmonary tuberculosis," are misleading for the detection of truly incipient subapical acute processes."

One could hardly wish for a more complete confirmation of the views which Dr. Ameuille and I published in 1921 and 1922. It is true that the American writers speak of the extended and excavated lesions as forming in less than six months, whereas we spoke of a few days only. This apparent discrepancy is easily accounted for by the fact that their survey included only sanatorium patients whose initial episode went back generally to several months previous to their admission. We, on the contrary, have observed dispensary and hospital cases generally very soon after

the onset. If we substitute for the terms "acute subapical infiltration," which is synonymous with Assmann's "early infra-clavicular infiltration," the term "acute condensation with lobar limitation," which is more accurate and more in accordance with the real facts, we shall find ourselves in complete agreement with our colleagues from Detroit. I think, as they do, that the notion of this hitherto overlooked type of tuberculous disease (although it is really the most frequent) has important practical bearings. First of all, it must and can be diagnosed early. And it will be diagnosed early when practitioners will have acquired the habit of thinking that acute respiratory processes or undiagnosed febrile episodes must always raise the suspicion of tuberculosis and therefore be the occasion of an x-ray examination of the chest and a sputum analysis.

Furthermore, if early diagnosed, this most common type of tuberculosis will also be early treated. One should keep in mind that in this particular form of tuberculosis early collapse therapy achieves its most striking successes. Among Dr. Blanche's 200 patients, 173, or 86.5 per cent, had one-sided lesions. Tuberculosis is seldom bilateral from the onset, and the number of cases which would recover if collapse was initiated in due time much greater than one generally supposes. But we must not overlook the onset.

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THE USE OF VITAMINS A AND D AND SODIUM IODIDE IN THE PRE-OPERATIVE TREATMENT OF GRAVES' DISEASE\*

By ROY H. FRASER, B.A., M.D., AND A. T. CAMERON, D.Sc., F.R.S.C.,

Winnipeg

AT the suggestion of Dr. I. M. Rabinowitch, Messrs. Ayerst, McKenna, and Harrison prepared a mixture of vitamins A and D (a concentrate from cod-liver oil), with which was incorporated iodized jeoleic acid,  $\text{CH}_3 \cdot (\text{CH}_2)_m \cdot \text{CHI} \cdot \text{CHI} \cdot (\text{CH}_2)_n \cdot \text{COOH}$ . This was given the trade name of "Vitiodum" (Forte) and put up in the form of gelatine capsules. Each capsule contained 0.03 gm. of iodide (combined in the fatty acid), the equivalent of that present in 10 minimis of Lugol's solution. Both Dr. Rabinowitch, and Dr. E. H. Mason obtained good results with this preparation in the pre-operative treatment of Graves' disease.

A year ago Adamson and Cameron communicated to this *Journal* a study of the effect of the preparation<sup>1</sup>. They draw the following conclusions:

"Vitiodum, a combination of vitamins A and D and an iodo-fatty acid, is as effective as Lugol's solution when administered in Graves' disease, its beneficial action, and the limits of its beneficial action, closely resembling those of Lugol's solution. Vitiodum has not, in our experience, produced any gastro-intestinal disturbances during or following its administration. It is probable that neither the vitamins nor the iodo-fatty acid alone are effective. . . . It remains to be determined whether both A and D or but one of them is necessary, and whether the iodized jeoleic acid can be satisfactorily replaced by iodides and other types of iodine compounds."

They emphasized the desirability of further work to investigate as widely as possible the relation between the vitamins concerned and thyroid and iodine metabolism.

In this paper we report results indicating that sodium iodide is as effective as an iodized fatty acid as a medium for conveying iodine in association with the two vitamins for satisfactory pre-operative treatment of Graves' disease.

In investigations of this nature we regard it as essential that the patient be in hospital and under complete control, that he should not have had treatment with Lugol's solution for at least several weeks previously (and preferably not at

all), and that only cases with a clear picture of Graves' disease be treated, since there is still conflict of opinion as to whether or not Lugol's solution itself is beneficial in cases of so-called toxic adenoma. The second of these desiderata is not easy to secure, since at present treatment with Lugol's solution appears to be the routine initial procedure with every presumptive case of Graves' disease.

Hence, we are only able to report on four cases. The definite results obtained, however, seem to justify this report. A fifth case is mentioned as a further illustration of the fact that when Lugol's solution has been continued beyond the point of lowest fall of basal metabolic rate, and the latter has again risen to a high level, immediate substitution of vitamin-iodide (or iodized fatty acid) for the Lugol's solution does not produce any beneficial change.

The vitamin capsules used for these cases contained 1250 units of vitamin A (U.S.P. technique of measurement) and 250 units of D (technique of McCollum, Simmonds, Shipley and Park). The dosage was one capsule, three times a day. The iodide was given in aqueous solution. Since iodine is excreted more rapidly when given as iodide than as iodized fatty acid, six doses were given daily, each containing 0.035 gm. of sodium iodide (equivalent to 0.03 gm. iodine). Analysis of the vitamin capsules by Kendall's procedure showed complete absence of iodine from them.

In the case reports which follow only those data pertinent to the subject of this paper are detailed.

CASE 1

John D., aged 29. He was admitted to the Winnipeg General Hospital in April of this year, showing all the clinical signs of Graves' disease, including very marked exophthalmos, this being the outstanding feature. The condition was of 3 to 4 years' standing. Fibrillation was absent and there had been no abnormal loss of weight. There was occasional diarrhoea. After the determination of the basal rate which was +81 per cent, he was the same day placed on the treatment and his progress is shown in the following Table.

\* From the Department of Biochemistry, Faculty of Medicine, University of Manitoba.

TABLE I

Date	Weight lbs.	Basal Metabolic Rate	
			per cent
April 16	126	+81	
20	126	+64	
23	126.5	+51	
26	129	+43	
29	129	+31	
May 2	129.5	+19	
6	133	+17	
9	134	+14	
13	135	+24	
16	136	+32	

He showed a definite clinical improvement, commencing on April 19th and continuing. He was kept in bed throughout. His pulse rate, initially varying between 90 and 110, showed the same type of fall as that described for patients under vitiodum treatment in the paper by Adamson and Cameron. It was observed that by May 3rd he could sit up in bed and play poker without an increased pulse rate. His temperature was practically normal throughout.

Dr. J. E. Lehmann performed a bilateral resection of the thyroid on May 17th and the patient made an uneventful recovery.

Dr. Wm. Boyd made the following pathological report: "Macroscopic: both lobes of a moderately enlarged diffuse thyroid presenting a colloid appearance. Microscopic: areas of marked epithelial hyperplasia alternating with areas of dilated acini filled with dense colloid."

#### CASE 2

Wm. E., aged 33. Moderate enlargement of both thyroid lobes, and marked enlargement of the isthmus. No exophthalmos. Fine tremor. General, but not marked, symptoms of Graves' disease. He had lost some weight during the previous year. A basal metabolic rate test, carried out on September 19, 1928, gave the figure +30 per cent. He was admitted to the Winnipeg General Hospital on April 2nd, and the treatment was commenced on the 4th. He was ambulant throughout the treatment. The results are shown in the following table.

TABLE II

Date	Weight lbs.	Basal Metabolic		
		Rate per cent	Treatment	
April 4	155	+36	A+D+NaI daily.	
12	158	+12		
14	...	....	Treatment discontinued.	
19	161	+18		
24	163	+21		
30	164	+38	A+D+NaCl daily.	
May 4	164	+39		
7	164.5	+35		
10	165	+40	A+D+NaI daily.	
13	165	+42		
16	166.5	+33		
20	168	+23		
23	169.5	+20		
30	169	+14		

He had had no treatment with Lugol's solution since November, 1928. During the periods of treatment with vitamins and sodium iodide he showed no marked clinical change, but became definitely less nervous. While this treatment steadily lowered the basal rate (though more slowly the second time) treatment with the vitamins and sodium chloride (a somewhat larger dose, 10 grains six times a day) produced no such effect.

Dr. J. A. Gunn performed a bilateral resection of

the thyroid on June 1st, and the patient made an uneventful recovery. On the 11th his basal rate was +2 per cent, and his weight 161.5 lbs.

Dr. Boyd's pathological report reads: "Macroscopic: A large diffuse goitre; microscopic, a very resting picture with no hyperplasia."

#### CASE 3

Wm. R., aged 50. This patient was first admitted to the Winnipeg General Hospital on May 1, 1924, (aged 45). His basal metabolic rate on the 3rd was +93 per cent with a weight of 118 lbs. Treatment with Lugol's was instituted and on the 14th the rate was +35, and on the 26th, +23 per cent, (weight 118.5 lbs.). On the 27th a bilateral resection of the thyroid was performed by Dr. Gunn, five-sixths of the gland removed, including the isthmus, the patient made a satisfactory recovery, and was discharged on June 13th. The pathological report stated: "A colloid appearance, and microscopically dense colloid, with localized areas of hyperplasia."

He was re-admitted on April 2nd of this year, stating that he had been well until six months previously, and had since then lost 35 lbs. in weight. He had taken Lugol's solution, but not within five weeks of admission. At this time the thyroid showed an apparent slight enlargement, there was marked exophthalmos, and a somewhat lessened sugar tolerance. The treatment with the vitamins and sodium iodide was instituted on April 5th and continued till the 17th. On the 7th, by mistake, two doses of Lugol's solution, each 10 minims, were given. The vitamin-iodine treatment led to a definite lowering of the basal metabolic rate as the following figures show.

TABLE III

Date	Weight lbs.	Basal Metabolic Rate	
			per cent
April 5	110	+37	
12	111	+29	
17	112	+15	
24	114	+16	

He showed a corresponding clinical improvement. He was discharged from hospital on the 26th.

#### CASE 4

Harry A., aged 30. He was admitted to the Winnipeg General Hospital in May, showing definite symptoms of Graves' disease, including fine tremor and exophthalmos, though the thyroid was not palpable. Treatment was commenced on May 24th. The results are shown in the following Table:

TABLE IV

Date	Weight lbs.	Basal Metabolic Rate	
			per cent
May 21	113	+68	
30	113	+43	
June 3	113	+42	
6	115	+32	
10	116	+32	

There was corresponding clinical improvement. Thus, on June 7th, the attending physician noted that the general symptoms were improved, there was little tremor, the pulse was 70, and he was less nervous. On June 13th a bilateral resection of the thyroid was performed by Dr. Gunn. The patient made a steady recovery.

The pathological report states: "The thyroid tissue is quite firm, having the appearance of skeletal muscle cut in cross-section. Microscopically, the gland is in a resting state but shows small areas of hyperplasia."

## CASE 5

Leslie O. This patient had had Graves' disease for several years, and with marked symptoms for the previous eighteen months. He had been treated with Lugol's solution from April 14th to May 13th. The basal rate fell, but not to a point sufficiently low to render operation desirable. Increasing the dosage produced no better result. Lugol's solution was discontinued for twenty-four hours, and the vitamin-iodide treatment then commenced (May 14th). The results, which seem to be non-beneficial, are shown by the following figures:

TABLE V  
Basal Metabolic Rate

Date	Weight lbs.	per cent
May 14	141	+89
17	143	+76
20	146	+85

The treatment was thereupon discontinued.

## DISCUSSION OF RESULTS

The results with Cases 1 to 4, compared with those reported by Adamson and Cameron, show clearly that replacement of iodized fatty acid by sodium iodide produces equally beneficial results. The combination of iodide and the two vitamins would appear, like vitiodum, to be of equal value with Lugol's solution in the pre-operative treatment of Graves' disease. The therapeutic problem would therefore seem to be the selection of that iodine compound which can be most conveniently administered with the vitamins.

Case 2 is, in addition, a useful control, providing further evidence that the two vitamins alone (since of course the effect of the sodium chloride solution can be neglected) are without effect. Case 5 indicates, as did Case 9 of the earlier series, that a period of probably some weeks without medication is necessary if the

combined vitamin-iodide treatment is to be applied after too prolonged administration of Lugol's solution.

In none of the cases was any gastro-intestinal disturbance produced by the treatment.

We are indebted to Dr. William Boyd, for the pathological reports. He states that the pictures are essentially similar to those seen in thyroid material from cases of Graves' disease after treatment with Lugol's solution.

It is now necessary to determine whether both of the vitamins, or which one of the two is necessary, to produce the beneficial action that has been demonstrated. We propose to attempt to solve this problem as the next step.

Our results have, of course, no bearing on the post-operative treatment.

## SUMMARY

A combination of vitamins A and D and sodium iodide produces the same beneficial effect as "vitiodum" and as Lugol's solution in the pre-operative treatment of Graves' disease.

Some further evidence is provided that the vitamins alone are without action.

We desire to thank Drs. J. E. Lehmann, F. A. Young, F. A. Benner and A. W. S. Hay for permitting us facilities for this work and for their co-operation.

Our thanks are also due to Messrs. Ayerst, McKenna, and Harrison, for the supplies of vitamin-concentrate used in this investigation.

## REFERENCE

1. ADAMSON, G. L., AND CAMERON, A. T., *Canad. M. Assn. J.* 19: 420, 1928.

PROPER SHOEING OF THE CHILD.—John D. Adams insists that parents should be educated not only with regard to the proper type of shoe to be worn by the child in early life but also in an intelligent understanding of its construction, and of the reasons why the growing foot should be respected in its anatomical development. The first shoe should emulate a paper bag, possessing just enough shape to make it possible to designate it as a shoe. Its material should be soft white kid with a flexible unresisting sole, with a draw string of tape at the top. Its function should simply be that of a protecting covering. Between the ages of 2 and 5, the child should have something a little more substantial as a protection. There are seven vital and essential points to be incorporated in what might be termed the "ideal seven point shoe": 1. Breadth of toe. The shoe should be sufficiently broad to allow the toes to assume a natural uncompressed weight-bearing posi-

tion. 2. Length. All shoes should be at least one-half inch longer than the weight-bearing foot. 3. Depth and fulness of the toe. 4. Close fitting well shaped heel, tapering at the top to fit the natural conformation of the os calcis. 5. Depth from the vamp at the dorsum of the foot over the midtarsus to the sole. Depth and fulness are necessary here, not only to accommodate the normal fulness in the contour of the foot but also to allow freedom of action in foot mechanics, in raising on the toes in the act of walking. There must be a lack of constriction at this point to allow a proper bearing and leverage of the toes. 6. Broad flexible sole, with a straight outside bearing from the tip of the little toe to the width of the heel. 7. Height of the heel. Starting with the "paper bag shoe," up to the age of 3½ years, the child's shoe should not have a heel any thicker than the sole. From 3½ years up to 5 years, the heel should be twice as thick as the sole.—*J. Am. M. Ass.*, 1929.

## THE EFFECTS OF IODINE TREATMENT, WITH AND WITHOUT VITAMINS, ON THE BASAL METABOLIC RATE IN EXOPHTHALMIC GOITRE\*

By I. M. RABINOWITCH, M.D.,

*Montreal*

IT is now generally recognized that individuals suffering from exophthalmic goitre benefit from the use of iodine. Of this there is both clinical and laboratory proof. Following the administration of iodine there is noted a decrease of the severity of the signs and symptoms of the disease, the basal metabolic rate decreases, and operative measures are rendered more safe. Though Lugol's solution appears to be the form in which iodine is generally given, other iodine-containing mixtures and compounds have been used with, apparently, equally good results. Occasionally, all forms of iodine treatment fail. As a matter of fact, iodine may not only fail to relieve, but may actually intensify, the signs and symptoms of the disease.

The mechanism of the action of iodine in this condition and the relationship of iodine to thyroid activity in general are, as yet, unknown. Proof of this may be found in the numerous theories advanced, many of which are unsupported by experiment. A prevalent explanation of the beneficial effects of iodine in exophthalmic goitre is that such individuals have an insufficient supply of this element. Though there appear to be data to support this view, it is rather difficult to reconcile it with certain known facts. One of the characteristics of iodine is the marked disproportion between its importance in the human economy and the amounts required for functional purposes. According to available data a little over one milligram a day appears to suffice. Opposing this view is also the finding that, at least as far as the thyroid gland itself is concerned, such individuals do not seem to lack iodine, and when iodine is given, the gland may be found to contain enormous quantities of it, but, in spite of this, the basal metabolic rate may remain high. This is shown in Table I which represents a series of analyses of thyroid glands made in this laboratory with regard to their iodine contents.

The data show that whether the thyroids were from patients with, or without, hyperthyroidism, the amounts of iodine, both per gram of dry tissue and per gland, were at least equal to those found in tissues of non-goitrous individuals. This also applied whether the thyroids from the patients with hyperthyroidism did, or did not, contain adenomata. As a matter of fact, the values corresponding to the total amounts of iodine recorded here, with the exception of the normal glands, are, in many cases, much below the true values. The normal material was obtained at autopsies of individuals without goitre, and it was thus possible to obtain the total amount of thyroid tissues in each case; whereas, the diseased tissues represented operative material, and in no case therefore, was it possible to obtain the complete gland. In addition to this, in some instances, half or more of the material which was removed at operation was not available for chemical analyses, having been sent to the pathologist for his examination.

The tissues obtained from the patients with exophthalmic goitre are of particular interest. Though some of the patients represented here with non-toxic goitre, and those with hyperthyroidism, with adenomata, received iodine, the amounts given were extremely small. The patients with exophthalmic goitre, however, received large quantities of this element. It will be noted in these cases that not only were the values corresponding to the milligram of iodine per gram of dry tissue greater than the normal, but also those corresponding to the total amounts, and, at the same time, the basal metabolic rates were increased. Two cases are particularly of note. The total amounts of iodine per gland were 141.3 and 121.4 milligrams respectively, and the corresponding basal metabolic rates were +36 and +56 per cent.

The technical details of the iodine determinations were previously described,<sup>1</sup> and, for brevity, will not be repeated here. It may, however, be stated that with this method it is pos-

\* From the Department of Metabolism, the Montreal General Hospital, Montreal.

TABLE I.  
IODINE CONTENTS OF THYROID GLANDS

Type	Not Treated with Iodine				Treated with Iodine			
	Dry weight (gms.)	Iodine			Dry weight (gms.)	Iodine		
		Mgrm. per gm. dry tissue	Total mgrms.	B.M.R.		Mgrm. per gm. dry tissue	Total mgrms.	B.M.R.
Normal (complete gland)	4.63	1.32	6.11					
	6.32	1.64	10.36					
	8.27	1.00	8.27					
	5.34	1.47	7.85					
	5.57	1.05	5.84					
		1.29	7.69					
Non-Toxic Goitre (incomplete gland)	8.42	1.69	14.23	-4	6.42	1.37	8.79	+5
	6.54	1.31	8.57	+6	8.36	1.42	11.87	+8
	12.16	0.74	9.00	+10	11.34	1.24	14.06	+3
	9.32	1.09	10.15	-1	3.57	1.61	5.75	+9
	4.16	0.78	3.24	+2	7.28	1.08	7.86	+10
		1.12	9.04			1.34	9.66	
Toxic Goitre with Adenoma (incomplete gland)	8.42	0.86	7.24	+42	9.56	1.32	12.92	+59
	6.85	0.69	4.73	+30	4.96	1.42	6.04	+36
	5.42	1.05	5.69	+60	5.30	1.56	8.26	+45
	3.25	1.35	4.39	+51	6.01	1.61	9.67	+38
	6.57	1.35	8.87	+22	5.47	0.81	4.43	+29
		1.06	6.18			1.34	8.26	
Exophthalmic Goitre (incomplete gland)	6.12	1.12	6.85	+38	17.47	8.11	141.3	+38
	3.84	1.02	3.91	+44	6.62	3.50	23.2	+42
	7.15	0.65	4.65	+68	21.72	5.59	121.4	+56
	5.75	1.34	7.70	+41	5.59	2.82	15.7	+32
	5.25	1.81	9.50	+57	10.30	2.61	26.8	+25
		1.18	6.52			4.52	65.7	

sible, with proper care, to recover as much as 150 milligrams of added iodine with an error of 0.2 milligrams, an accuracy sufficient for the present purposes. In all of the cases the basal metabolic rates recorded represent those found just prior to thyroidectomy.

These data appear to demonstrate definitely that lack of iodine is if at all a factor not the only one responsible for the clinical signs and symptoms of exophthalmic goitre, in spite of the fact that the administration of iodine leads to improvement. The recent observations of Williamson and Pearse<sup>2</sup> are of interest here. These authors have shown that there is no absolute lack of iodine in Graves' disease, but that a relative lack may complicate the picture; and that though the relative lack of iodine may be relieved by iodine feeding, its effect on the thyrotoxicosis is not yet clear. This conclusion was based upon the demonstration of the existence of at least two factors which are concerned with thyroid physiology, namely, (a) a secreting function, and, (b) an iodo-colloid function; and these are not mutually derivative.

The above observations lead to the conclusion that factors other than iodine must be considered in the etiology of exophthalmic goitre. Many have been suggested, and amongst them is vitamin deficiency. That vitamins may be concerned with the metabolism iodine was shown by McCarrison.<sup>3</sup> More recently, and further suggestive, are the observations of Harvey.<sup>4</sup> This author has shown that cod liver oil when fed to goats causes the passage of more iodine into their milk than when equivalent amounts of potassium iodide and olive oil are fed.

That vitamins are concerned with the metabolism of inorganic elements hardly requires further proof. Interesting here, particularly, are the recent observations of Harris and Moore<sup>5</sup> with regard to phosphorus and calcium. These authors have shown that lack of vitamin D leads to a deficiency of phosphorus or calcium, or both, and to defective calcification, whereas, excess quantities of vitamin D result in an opposite picture, namely, excess quantities of calcium or phosphorus, or both, and excess calcification. Other such examples could be cited. It is, there-

fore, possible that in hyperthyroidism we are dealing with a somewhat similar situation with regard to iodine. Iodine deficiency, in spite of excess quantities found in the gland, could then be explained. An analogy is suggested in the relationship between the calcium content of blood and the bleeding time in cases of jaundice. In this condition, the bleeding time, as is well known, may be prolonged, and an administration of calcium may shorten it. In spite of the prolonged bleeding time, however, the calcium content of such bloods is always invariably found to be normal. In other words, though a normal amount of calcium may be present in the blood, it is not all available for clotting purposes. The present view is that in such cases the calcium is bound with the excess bile pigments.

The fact that the administration of iodine alone leads to improvement of the patient in many cases does not oppose the idea of vitamin deficiency. Numerous analogies may be found in the metabolism of man. At any rate, iodine does not cure, nor does it control all of the disturbances in, Graves' disease; the beneficial effects which may result from its administration are not permanent and, finally, it may, at times, aggravate, rather than alleviate, the condition.

In view of the above observations, the writer had prepared a mixture of vitamins A and D in high concentrations in combination with an iodo-fatty acid. Clinical experience with it seemed to suggest that it was not only as effective as Lugol's solution, but that it was superior to it. These results, because they were few in number, were not published. Adamson and Cameron<sup>6</sup> acting upon this suggestion (personal communica-

cation) made somewhat similar observations. According to these authors it also appeared that there was some positive vitamin reaction and that both the vitamin and iodized fatty acid fraction were necessary.

Because of the above results, the writer had prepared a mixture, in capsule form, with much greater concentrations of vitamins. Each dose given corresponded to the following:

Vitamin A .....	1250 units
Vitamin D .....	250 "
Iodine .....	30 mgm.

Some idea of these dosages of vitamins may be gained from the amounts of the following common articles of diet approximately necessary to yield corresponding amounts of vitamin A.

Apples (raw) .....	100 oz.
New cabbage (raw) .....	100 "
Orange juice .....	80 "
Lettuce .....	30 "
Fresh milk (whole) .....	20 "
Green peas .....	10 "
Fresh butter .....	3 "
Carrots (raw) .....	2½ "
New-laid eggs .....	3 "

To test this product, twelve patients suffering from exophthalmic goitre were selected at random. In each case the above mixture was given twice daily. Basal metabolic rates were determined at regular intervals of four days during the periods of observation. The latter was used as an index of progress, not because other features of the disease are not of equal, or even of greater, importance, but because it is the only feature of the disease which can be expressed reasonably quantitatively. The combined results are recorded in Table 2.

TABLE II.  
EFFECT OF IODINE TREATMENT WITH AND WITHOUT VITAMINS ON THE BASAL METABOLIC RATE

Lugol's							Vitiodum						
Iodine (mgms.)			B. M. R. (per cent)				Iodine (mgms.)			B. M. R. (per cent)			
Daily dose	Days	Total dose	Before	After	Total reduction	Reduction per day	Daily dose	Days	Total dose	Before	After	Total reduction	Reduction per day
115	11	1265	96	44	52	4.72	60	13	780	74	14	60	4.61
116	7	812	46	16	32	4.57	60	8	480	62	15	47	5.87
116	7	812	33	11	22	3.14	60	12	720	46	23	12	1.00
58	4	232	59	40	19	4.75	60	13	780	78	27	51	3.92
58	19	1102	69	36	33	1.74	60	10	600	77	43	34	3.40
57	7	406	18	6	12	1.71	60	4	240	79	57	22	5.50
57	14	798	19	5	14	1.00	60	5	500	100+	67	33	6.60
116	6	696	44	26	18	3.00	60	9	540	72	28	44	4.89
115	7	805	48	41	7	1.00	60	5	300	57	40	17	3.40
116	5	580	45	20	25	5.00	60	7	420	61	29	32	4.57
58	8	464	57	9	48	6.00	60	5	300	66	22	44	8.80
58	8	464	60	43	17	2.12	60	5	300	65	43	22	4.40

In order to compare the effects of this mixture with those of Lugol's solution, twelve patients who were treated with Lugol's were selected at random. The results of the treatment in each case were previously reported in this *Journal* by Fitzgerald with regard to a different problem. They are reproduced in Table 2 for comparative purposes only. It will be seen that the average decrease of the basal metabolic rate was 3.2 per cent per day with Lugol's solution and 4.7 per cent with the mixture of iodized fatty acid and vitamins. It is interesting to note that much less iodine was given with the vitamin-containing mixture than when Lugol's solution was used.

As with all biological experiments, there are a number of inherent difficulties in the interpretation of the results. This is because of variables, some of which are recognized and difficult to control, while the existence of others may not even be suspected. One means of reducing the effects of such variables is to treat the data statistically. One must, however, have available a much larger series of experiments, in order to attach significance to the results. However, to eliminate one source of error as much as possible, the groups compared were made as similar as is possible clinically. In each case the diagnosis was the same and the treatment was alike in every respect, except for the iodine medication. The clinical and pathological diagnosis was exophthalmic goitre only, and the subjects were confined to those with smooth, uniformly enlarged goitres, associated with hyperthyroidism and with exophthalmos. The period of observation in each case was from the first day iodine was administered to the end of the first interrupted fall of the basal metabolic rate.

In the accompanying chart the results of two other experiments are graphically reported. Unfortunately, it is almost impossible to obtain many such data, since, recently, practically every patient admitted to the hospital with a diagnosis of exophthalmic goitre has been given iodine beforehand. These two experiments are reported, therefore, not because the writer is convinced the results would apply to a larger series, but to suggest the possibility, in order that such experiments may be repeated by others with similarly available material.

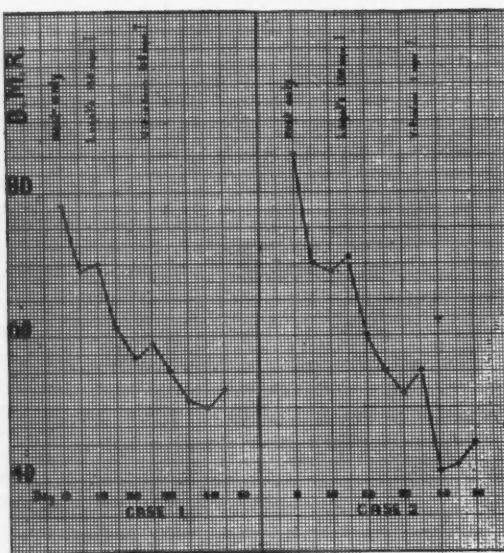
In the first case, it will be noted that the

basal metabolic rate before treatment was +78 per cent on admission. Ten days later there was evidence that the basal metabolic rate had become stabilized and that the maximum effect from bed rest was obtained. Lugol's solution was then given. With this treatment, the patient received 130 mgm. of iodine per day. At the end of twenty days the basal metabolic rate had dropped to +57 per cent and on the twenty-fifth day it appeared there would be no further drop. As a matter of fact, the basal metabolic rate was then +59 per cent. One of the above-mentioned capsules was then given twice a day. The total daily dose of iodine corresponded to 60 mgm. A further drop in the basal metabolic rate occurred, reaching its lowest level on the fortieth day at +50 per cent. The basal metabolic rate thereafter began to increase, a result not unlike prolonged treatment with all other forms of iodine.

In view of the above result, an attempt was then made to determine whether the vitamin combination, with an amount of iodine equal to the normal daily demands, would have any effect. On the first day of observation, the basal metabolic rate was +85 per cent. At the end of ten days the basal metabolic rate had apparently reached its lowest level with bed rest. It was then +69 per cent. On the fifteenth day there appeared to be evidence that the maximum effect from bed rest was obtained, and, again, as in the first case, the basal metabolic rate tended to be little higher than during the last observation, namely, +71 per cent. Lugol's solution was then given, and, as in the first case, the daily dose of iodine corresponded to 130 mgm. The lowest basal metabolic rate was reached at the end of the thirtieth day at +52 per cent. On the thirty-fifth day it was +55 per cent. Vitamin treatment was instituted. One capsule of the mixture was given twice a day. The daily amount of iodine corresponded to 2 mgm., or, practically, according to available literature, the requirements of the normal individual. Five days later, that is, at the end of the fortieth day the basal metabolic rate had dropped to +41 per cent. On the forty-fifth day it was +42 per cent. Thereafter, the basal metabolic rate commenced to rise and on the fiftieth day it was +45 per cent. Here, there-

fore, there again appears to have been a positive vitamin action.

EFFECT OF IODINE TREATMENT WITH AND WITHOUT VITAMINS ON THE BASAL METABOLIC RATE



Further evidence strongly suggestive of positive vitamin action may be found in the recent work of Frazer and Cameron on the use of sodium iodide combined with the above concentrations of vitamins A and D.\* (See this *Journal* p. 153).

#### DISCUSSION

It appears, from the above experimental data, that the administration of large quantities of vitamins A and D influence the course of ex-

\* The writer is indebted to these authors for the privilege of seeing their data prior to their publication.

EDINBURGH UNIVERSITY MEDICAL BUILDINGS—At the statutory half-yearly meeting of the general council of the University of Edinburgh, held on May 1st, Principal Sir Alfred Ewing presided, and referred to his resignation of the office of principal at the end of the current academical year. He commented on the very exacting nature of the office and the heavy tasks that it involved, for which in the future he felt himself unequal. The Scottish universities, he said, were very fortunate in their constitution, and the people who had framed them had been extraordinarily far-seeing, for the constitution admitted of expansion and had produced valuable and effective progress in recent years. Great developments were now proceeding in the scientific departments at the

ophthalmic goitre. The nature of the mechanism is not understood.

One can hardly experiment without some speculation, and certain possibilities suggest themselves. One or the other, or both, of the vitamins may assist in the assimilation of iodine. This phase of the subject is now being considered. On the other hand, vitamins may not be concerned with the metabolism of iodine, but with the control of the secreting function described by Williamson and Pearce. Another suggestion is that the action may be indirect, by influencing the course of the metabolism of other inorganic elements, calcium, etc. This is suggested because of the use of vitamin D. Highly speculative as all of these suggestions may be, they are mentioned in order that they may be tested by others with similarly available material and facilities.

Grateful acknowledgment is due the Chiefs of the various services of the hospital for their co-operation, to Dr. E. M. Eberts for the supply of the surgical material for chemical analysis, and Dr. L. J. Rhea, our pathologist. I am also indebted to Miss Margaret Bruce and Miss Margaret Cameron who were responsible for all of the basal metabolic rate determinations, and to Miss Eleanor V. Bazin who did many of the iodine analyses.

Acknowledgment is due Messrs. Ayerst, McKenna, and Harrison for the necessarily careful preparation and standardization of the vitamin-iodine mixtures and their supply gratis for the purposes of this investigation. To this preparation they have given the name "vitiodum."

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King's Buildings, and progress had been made in the departments of arts and medicine. One of the last acts with which he had been concerned as principal was a scheme for the interior reconstruction of much of the medical buildings. Those buildings had been a splendid novelty in their day, but they had become out of date owing to changes in the subjects to be taught and in the manner of teaching them. A drastic internal reconstruction would be necessary, which would cost something like £60,000, but he believed this money would be available before he relinquished office. He referred also to the recent development of hostels for students at Edinburgh.

## STUDIES IN DIGESTIVE PATHOLOGY

## II. THE MECHANISM OF FERMENTATION AND PUTREFACTION IN THE INTESTINES

BY JOSÉ M. ROSELL, M.D.,

*Professor of Digestive Diseases, Barcelona, Spain*

BEFORE I consider the mechanism of fermentation and putrefaction, it will be well to deal with some points about intestinal bacteria and certain new methods of physio-pathological investigation of the small intestine.

## INTESTINAL BACTERIA AND THEIR IDENTIFICATION

In the study of intestinal bacteria it is necessary to consider separately: (1) the bacteria of the small intestine; (2) the bacteria of the caecum and the proximal part of the colon (ascending and transverse); (3) the bacteria of the distal part of the colon; and (4) the bacteria of the faeces, which never should be considered the same as the intestinal bacteria.

In carrying out a study of the bacteria of the faeces we are able to recognize only the bacteria which can live in the faecal material. Only 1 per cent of the normal bacteria living in the higher parts of the intestine can be recovered in culture from the faeces in normal conditions. About 99 per cent appear to be dead, if diarrhoea is not present. Further, the bacterial flora in the rectal cloaca is very different from that in the higher parts of the colon, and especially from that of the small intestine. From the living bacteria found in the normal faeces we can draw conclusions only as regards the bacteria which live in the rectum and the lower part of the colon.

The most important clinical progress toward the knowledge of intestinal bacteria has been made through studies with the bacteriological intestinal tubes of Ganter and Van der Reis, and the "Darmpatrone" method, which is an improvement on the intestinal tube of Einhorn and Gross. Van der Reis, particularly, has greatly perfected the practice of this exploratory method for the bacteriological study of the small intestine. Ganter, Bogendorfer, Schembra, Einhorn, MacClendon, Welmore, Reynolds, McClure, Hudson, Parr, and Campbell have also made very important studies by

this method, which I, too, have found to be successful.

The first peculiar advantage of the Van der Reis cartridge tube method without electromagnet ("Darmpatrone" method) is that it makes it possible to obtain and isolate the intestinal contents with complete asepsis at any points of the intestine desired. The little "Darmpatrone" (3.51 mm. in diameter) can be easily swallowed. The withdrawal of the intestinal juice is done by means of a syringe in the interior part from the tube, as with the ordinary tubes. The passage and situation of the cartridge or olive can be controlled with the x-ray. The new rubber tube of Van der Reis, impregnated with zinc oxide furnishes good visibility of its passage. With the other systems proposed by Bogendorfer, Goldman, Freeman, Miller, and others, it is also possible to obtain the unaltered juice, but not so easily and surely as with the process of Van der Reis.

I have found it possible to isolate a part of the intestine from its superior part in the following manner. A small rubber tube, having fastened to its lower end a little rubber balloon, is tied parallel to the usual intestinal tube. The olive end of the intestinal tube extends ten to twenty centimetres beyond the balloon. When the olive reaches the desired place, the balloon is inflated with a measured quantity of air (usually 20 to 30 c.c.) by means of a syringe. The rubber tube leading to the balloon is then shut off with a clamp. To facilitate the swallowing of the balloon it is covered with a thin dialyser of cat-gut membrane, or gelatine or glutoid capsule, which is more or less easily and quickly digested on arrival in the stomach or intestine, but this procedure does not always give the desired result. It is sometimes possible to see the area of air from the insufflated tube.

For the examination of intestinal juice in which bacterial sterility is not necessary one

may use the ordinary duodenal tube. The intestinal juice thus obtained can then be analyzed for its morphological, chemical, physical, bacteriological, physiological, enzymic and other contents. It can also be examined for normal resorption of digested food, and for pharmacological substances to prove their action upon the intestine or their elimination, and for the therapeutic application of medicinal substances, buffer solutions, bacterial suspensions, etc., in the desired portion of the small or large intestine. It is desirable still to extend the studies so far made with this method, in order to obtain more information about the physiology and pathology of the location and manner in which albumins and their digestive products, as well as the carbohydrates and fats, are absorbed.

The sterility often found in the old bacteriological tests in the duodenum must be regarded with a great deal of doubt, because of the difficulty in the culture of many of the intestinal bacteria in ordinary culture media. Van der Reis and his school<sup>1,2</sup> have found, by means of the bacteriological intestinal tube, that the small intestine, before eating, is poor in bacteria but not absolutely sterile. In the higher parts of the small intestine I have found, as have other investigators, long and short bacilli, always Gram-positive, lanceet-formed diplococci, and, in isolated cases, Gram-negative bacilli. The Gram-positive germs belong to the laetic bacilli, while the Gram-negative are mostly identified with the coli-aërogenes group. In the mid-intestine the flora is more varied. The number of the glycophile cocci is decreased; likewise, although somewhat less, the lactic bacilli. On the other hand, more genuine colon bacilli, and also other Gram-negative bacilli and related groups, appear. The lower small intestinal segment showed an increase of Gram-negative forms over the Gram-positive.

Out of the cæcum, Van der Reis obtained cultures of other types, principally anaerobic, such as *B. bifidus*, *B. phlegmone* *emphysematosa* (*perfringens* Veillon and Zuber; *saccharo-butyricus* *immobilis* Schattenfroh and Grassberger), *B. putrificus* Bienstock (*Clostridium butyricum* Prazmowski; *saccharo-butyricus* *mo-butyricus* *immobilis* Schattenfroh and Grassberger), in addition to the lactic bacilli known

to belong to the intestine. The *B. tetani* is also found in healthy persons to a certain extent.

The fermentative and putrefactive bacteria (often seen producing the two processes together) are the usual peculiar and obligate inhabitants of the intestinal tract of man and all vertebrates. Due to the activity of the juice of the small intestine in the disintegration of the disaccharides and hydrocarbons, a diminution of this juice is necessarily followed by an increase of the fermentation, because the bacteria have more material at their disposal. The rapid emptying of the stomach and the rapid passage through the small intestine of the hydrocarbons, particularly when much cellulose material is present, also contribute to the increase of fermentation. I have found hyperperistalsis and rapid passage in most of my investigated cases manifesting increased fermentation processes in the stool. Several nervous dyspepsias and diarrhoeas produce this result also. With the irritation produced by the products of fermentation there soon comes a fermentative catarrh which in a vicious circle predisposes the intestine to hyperperistalsis and fermentation.

I regard as other factors or causes of the pathological fermentation process the following:

1. A continued ingestion of large quantities of vegetable food, rich in cellulose, by persons with a weak intestinal tolerance for such food.
2. Insufficient action of the intestinal contents, or a too speedy intestinal passage.
3. Dyspepsia of all kinds and intestinal catarrh.
4. Abnormal bacteria, usually caused by ascension of bacteria from the lower segment of the small intestine, or from the colon, or because the small intestine is colonized by foreign bacteria, due to insufficient protection by the defensive powers of the small intestine.
5. Primary intestinal putrefactive processes due to abnormal putrefactive bacterial flora creating intestinal dyspepsia or catarrh.

The disintegration of the cellulose, pectin, and pentosane seems to begin (according to Van der Reis and Henneberg's<sup>3</sup> investigations) already in the intestine through the normal bacteria of its lower segments.<sup>1</sup>

The decomposition of carbohydrates (glucose, fructose, galactose, mannose), is effected by *B.*

*coli*, *B. lactis aeronglues*, *B. granulobacter*, *B. butyricus*, *B. pentaceticus*, *B. prodigiosus*, *B. perfringens*, *monilia torula*, (Ashford), etc. forming the various fermentation products; acetic acid, butyric acid, formic acid, acetaldehyde, alcohol, acetone, carbonic acid, hydrogen, methane, etc., and they differ according to the kind of infecting bacteria. I have found in my analyses several types of fermentation that can sometimes be recognized by their odour. But it is not always possible to demonstrate in the faeces the different kinds of fermentative bacteria.

The most recent studies of von Catel and von Graevenitz<sup>4,5</sup> have proved that acetic acid and other volatile fatty acids produce increased peristalsis, but lactic acid does not. In normal intestinal chyme, where the regular intestinal bacteria are found (Gram-positive lactic acid bacteria, *bacillus acidi lactic* and *enterococcus lacticus*), I have not found abnormal fermentation products. Wollman and Van der Reis were unable to discover amylolytic and fermentative bacteria in the normal small intestine. These bacteria have their special localization in the lower small intestine, cæcum and colon, and when they wander to other than their own locations, pathological changes are present. The most serious difficulties arise when bacteria which grow with fermentation leave their ordinary location [the so-called "Gaerkessel" (fermentation focus) of Von Noorden] and migrate to the upper parts of the ileum and jejunum, producing chyme infection, or, as Van der Reis says, a wall infection.

It is possible that the ascent of infective fermentation is more important for pathology than the infection itself. This ascent of the fermentative bacteria (especially of *B. coli*, which produces simultaneously fermentation and putrefaction, *amylobacter*, *clostridium*) is usually accompanied by diminution of the normal lactic acid bacteria in the small intestine. By the ingestion of these intestinal lactic acid bacteria, or *acidophilus* and yoghurt\* bacteria, in sufficient quantity, it is possible to obtain important therapeutic results

in these fermentative and putrefactive processes.

We believe that greater biological differentiation should be made than is generally done in medical bacteriology between the various milk acid bacteria, especially between those constantly present in the small intestine (*S. and B. lacticus*) and those called by Henneberg<sup>6</sup> "Wild milk acid bacteria" and "Kultur milk lactic acid bacteria," which form pure milk lactic acid, and the bacteria of fermentation which form acetic acid alcohol, CO, CO<sub>2</sub>, aldehyde esters, volatile fatty acids, and so forth. The normal milk lactic bacteria, peculiar to the human small intestine (*S. and B. lacticus*), cannot, according to our investigations, produce the abnormal fermentation products. On the contrary, they seem to be the natural enemies of fermentation and also of putrefaction.

The most practical method of differentiation for clinical purposes between normal fermentation bacteria and abnormal fermenting Gram-positive intestinal bacteria is to test their fermentative power on malted barley infusion beer-wort with juice obtained with the bacteriological intestinal tube. The normal sour milk bacteria coagulate milk with homogeneous uniform coagula and form no gas, whereas the fermentative bacteria and *B. coli* form gas bubbles.

The best culture media for the *B. lacticus* of the intestine are, a malted barley infusion or beer-wort; Kunze culture media; and Henneberg's food solution for lactic acid bacteria; or a culture medium of the following composition (after Henneberg) :—

Raw sugar .....	10	grm.
Ground barley malt (Keime) .....	1	"
Super phosphate .....	0.10	"
Calcium phosphate .....	0.05	"
Potassium biphosphate .....	0.05	"
Magnesium phosphate .....	0.05	"
Ammonium phosphate .....	0.01	"
Ammonium sulphate .....	0.01	"
Magnesium sulphate .....	0.03	"
Calcium carbonate .....	1.00	"

In order to have a simple clinical proof of the antifermentative power of the culture milk bacteria, I have made the following tests. To many persons who could not eat some of the classes of vegetables rich in cellulose, as, for instance, beans of all kinds, cabbage, turnips, etc., I have given several glasses of a strong culture of lactic acid bacteria, cultivated from the small

\* Yoghurt is fermented, coagulated milk, used as food extensively in the Balkans and also elsewhere, prepared with three kinds of bacteria, *S. thermophilus acidi lactic*, which gives it a pleasant and characteristic taste; the *B. bulgaricus* and the strong *thermus* bacterium yoghurt, which can produce 2 to 3 per cent lactic acid from milk sugar. It gives the sour taste to yoghurt.

intestine, or from the three bacteria of yoghurt and kefir, several hours before eating these vegetables. Almost without exception I found that after partaking of this culture of lactic acid bacteria these patients could eat the said vegetables without gas formation and with a marked decrease in dyspeptic troubles. In a few cases where the effect was not plainly visible, but rather the gases seemed increased, I was able to find that these lactic preparations were not fresh enough or had been infected by "wild" lactic acid bacteria or yeast. I did not make these tests with acidophilus milk, but it is possible that this would give the same results. Van der Reis and Henneberg have communicated similar results to me.

#### THE NATURE OF THE PUTREFACTIVE PROCESSES

The intestinal bacteria, especially when they work in co-operation, break up the albumins just as digestive ferments do, but they can decompose more than these ferments, because they can split amino-acid until it becomes ammonia (one of the last products of putrefaction).

Several bacteria, such as *B. putrificus* Bienstock, can also produce volatile fatty acids (valerianic, caprylic, butyric). Also, besides their enzymatic capacity these bacteria have also the power of decarbonizing and forming alcohol from amino-acids (F. Ehrlich). According to Guggenheimer, the bacteria of putrefaction can produce, for instance, leucinic acid, isocapronic acid, isoamylanin and isoamylalcohol, by dissemination, and isovaleric acid, by hydrolytic reduction, decarbonization and oxidation. Fermentative and putrefactive dyspepsias are to be treated as endogenous infections. These two processes must not be looked upon as opposites, as it has been proved that the *B. coli* growing in the intestine may cause carbohydrate fermentation or albumin disintegration, according to the actual reaction and the sugar content.

According to my investigations, the main factors of the putrefactive process are the following.

A. A large quantity of soluble albuminous products in the intestine, usually originating from the intestinal wall, caused by irritation of the same by catarrhal infection and a strong fermentative process.

B. Intake of a large quantity of protein food which increases the putrefactive process. This

is not, however, always the case, nor in as large a measure as the factor mentioned under A.

Concerning the cause of the ascension of the fermentative processes into the upper part of the small intestine, it is necessary to bear in mind the diminution of the bactericidal power against the fermentative and putrefactive infections as well as the already named factors involved in the increase of undigested products and possible intestinal catarrh. It is known that the duodenum and jejunum are the portions of the intestine which receive most of the bacteria from the stomach, but yet are the least germ-inhabited parts. Many other writers have thought the jejunum and upper part of the ileum to be sterile, but the investigations with the bacterial tube have proved definitely that lactic acid bacteria, *B.* and *S. acidi lactici* are contained there. These lactic acid bacteria are considered normal to these parts. In the lowest section of the small intestine other bacteria begin to live, particularly the coli-aërogenes group.

In my examined persons I have found this to be the normal picture. Concerning the sort of bactericidal powers of these portions several opinions have been expressed (Bienstock, Schutz, Eisklein, Prak, Bogendorf, E. Magnus-Alseleben, Rolly, Liebemeister, Bragstadt, Cash, Croll, Pope, Gomperts, Vorhans, Bas, Eggston, Norman). That the bactericidal powers of the stomach are rather weak is now accepted by many investigators. The flora of the first part of the small intestine is found by Van der Reis and Bogendorf to have approximately the same composition in hyperchlorydria as in achylia gastrica. We have found some differences.

The bactericidal powers of the small intestine have been found by me to be very strong in an investigated case of chronic lamblia infection of the gall-bladder. In the medical clinic of Professor Straub, at the University of Greifswald, working with Van der Reis, I studied a case of chronic lamblia infection (*giardia intestinalis*) of the gall-bladder for several months. This patient had had much digestive trouble and diarrhoea for many years. The intermittent diarrhoea was diagnosed as small intestinal and pancreatic diarrhoea. The stools contained as their outstanding characteristic large quantities of neutral fats and periodical decreases of bile pigment and diastatic ferments. The coprological and other clinical

explorations did not give the etiological diagnosis. The gastric juice was hyperacid. A study with the intestinal tube demonstrated duodenitis and jejunitis characterized by a great amount of small infiltrated mucous flakes and succorrhea in the duodenum and jejunum. The bilirubin and pancreatic ferment were present, but variable in quantity. Urobilin was negative (In a special study of urobilin, the results of which study are yet to be published, I have found tests to be positive in the first part of the jejunum and duodenum in all the patients examined). I have found it important that in the first part of the jejunum and duodenum there was constantly present a great quantity of *lamblia intestinalis*. By the transduodenal irrigation with magnesium sulphate solution, peptone, or ether, the quantity of lamblia was augmented to a very large degree. But the interest of this observation is that the lamblia in their passage through the small intestine were uniformly killed by their rapid intestinal passage. In the last part of the ileum there were found only isolated examples of the presence of flagellates. I have never found protozoa in the faeces even with the most careful centrifugalization used on the same day in which a large quantity of lamblia were expelled by means of magnesium sulphate introduced into the duodenum. I consider these cases as a proof of the bactericidal power of the intestine, more especially because a severe catarrh of the duodenum and jejunum were present. These cases also show the importance of intestinal exploration with the tube when other means of diagnosis have failed.

I believe that the discovery of the ascent of bacteria from the colon to the upper parts of the small intestine and the colonization of strange bacteria in the small intestine reveals an important cause of a number of chronic diseases, such as chronic fermentation and putrefaction, catarrh of the intestine, gall and pancreatic duets, acute and chronic intestinal dyspepsia. It is also noteworthy that this ascending infection of the faecal bacteria has been demonstrated as an important factor or cause for pernicious anaemia. (Consult the works of Seyderhelm, Knud Faber, Van der Reis, Bogendorfer, Norowitz, Strassburger, Lohr, Rosell). These are therapeutically important discoveries because these diseases may be treated directly by

irrigation with various therapeutic solutions and bacterial suspensions, etc., through the intestinal tube in conjunction with the usual therapeutic methods.

The coprological analysis or bacteriological study of the faeces never furnishes the diagnosis of these infections of the higher parts of the intestine. Only by the method of Bassler's intestinal bacteriological studies<sup>7</sup> are we enabled to obtain practical bacteriological knowledge of the lower intestinal flora. In the case of endogenous infection (Van der Reis) we must assume a wall infection of the intestine with *B. coli* which normally would be found only in the lower segments of the intestines.

The colonization of pathogenic bacteria is, however, not to be taken as primary, but as resulting from a changed small intestinal function which is probably due to a disturbance of the secretion of the intestinal juice. The reaction in the intestines of sick persons takes a large part in the etiology. Whether at the same time a real lesion of the intestinal wall is concerned has not been determined.

The results of therapy have confirmed the correctness of these diagnoses. Van der Reis<sup>8</sup> has proved that after removing a colonization of *B. tetanus* or *S. haemolyticus*, or an abnormal flora in the small intestine, secondary anaemia was completely cured. After determining the pathological colonization, irrigations were made of the jejunum, ileum and cæcum with physiological salt solution, disinfecting fluids and certain buffer solutions.

For the restoration of the normal flora the missing or repressed *B. lacticus* may be implanted. This kind of bacteriotherapy has been used successfully by employing a growth of the obligatory acid lactic bacteria found in the small intestine of a healthy person. Another factor for the maintenance of a normal colonization of the small intestine presents itself in the actual reaction which prevails in those segments whose change has a vast influence upon the flora.

The studies upon the hydrogen-ion concentration in the intestines were made by Long and Fenger, Meyers and MacClendon, MacClendon, Einhorn, Bissel, Lowe and Meyer, Van der Reis, Schembra, Bogendorfer, Wetmore and Reynolds, Freidenwald and Sindler, Okada and Arai, MacClure, Montague, Campbell, Hudson and Parr. Even though no complete uniformity of

results has been reached (which may partly be traced to the difference in experimental conditions), it has been established that the opinion hitherto accepted as to the intestinal reaction is erroneous. The reaction in the intestine is not decidedly alkaline, but acid. In all my explorations I have found the intestinal juice acid inclusively to litmus paper in the higher parts of the jejunum and ileum. The reaction changes to some degree with the digestion processes. The average hydrogen concentration in the upper intestine is pH = 6.28; the central PH = 6.46; and the lower 6.79. The value in the upper intestine lies between PH 5.4 and 6.6; in the central one between PH 6.2 and 6.7; and in the lower between PH 6.2 and 7.3, according to a series of investigations made on 63 normal persons. (Van der Reis and Schembra).

The dependence of the bacteria flora of the intestines on the reaction of the environment has also been ascertained recently in a number of publications. They treat of the relation of the hydrogen of the culture media to the various bacteria, their optimal conditions essential to life, and their inhibition by a certain characteristic H-ion concentration. (See Bruenn, Sheer, Adam, Demby, Michaelis, Michaelis and Marcora, Clark, Cannon and MacNease, Van der Reis). It has been demonstrated that by means of the H-ion concentration the bacteria have a more or less narrow growth zone and a pretty sharply defined growth optimum, and that beyond this zone they undergo serious disturbances of the power of multiplying, morphology and assimilation. Adam characterizes the H-ion optimum as the "Specific hydrogen number of the bacteria."

A change of reaction in the intestine, which is noticeable in certain diseases of the intestines, is always accompanied by a change of vegetation type, as has been experimentally proved (Van der Reis).

#### INDICAN AS AN INDEX OF PUTREFACTION IN THE COLON

In our parallel investigations of the appearance of putrefaction in the faeces and a test of indican in the urine, I have found no regular correspondence of values of these two manifestations: intestinal putrefaction, measured (tested) in the faeces, and the indican test in the urine.<sup>9</sup>

In persons having a high putrefaction value

in the faeces, I found the urine quite normal or with scant increase of indican. I also found the opposite to be true. I hold that the quantity of indican in the urine (except in cases where there is a disturbance of the small intestine) cannot be taken every day as a standard of the putrefaction process, and still less of intestinal auto-intoxication, whose nature is still not well understood, although much has been written and studied with regard to it. Also, I do not consider the results obtained through the study of the bacteria flora of the faeces, unless made with an efficient purgation, to be of great value for determining the intensity of the putrefaction process in the small intestine. Still less may the many indefinite symptoms of so-called "auto-intoxication" be used as a measure of intestinal putrefaction or intoxication. Many of these symptoms are not present in persons who show great intestinal fermentation and putrefaction, and very often these symptoms appear in persons who do not show abnormalities of the digestive canal.

#### TRANSDUODENAL IRRIGATIONS BY LIVING LACTIC ACID BACTERIAL CULTURES

For bacterial treatment of many intestinal diseases, as for examples, the dyspepsia of fermentation and putrefaction, enteritis, intestinal intoxication and other diseases of intestinal origin, the use of irrigations of living cultures from true lactic acid bacteria in the small intestine through the intestinal tube has been especially successful. For treatment of pernicious anaemia which, according to the fundamental idea of many authors (principally Hunter, Gravitz, Seyderhelm, Maravitz, Strassburger, Van der Reis, Ywam Wolgreenl, Von Noorden, Adam, Ashford, Gutierrez-Ygaravide, Rosell and others), has its origin in some cases in intestinal intoxication and in abnormal flora, especially in the ascension of bacteria from the colon and the faecal flora to the higher parts of the small intestine, the use of irrigations of lactic acid bacteria, especially of those cultivated from the highest parts of the small intestine, has proved itself as a valuable therapeutic agent.

Since the publication of one case of pernicious anaemia of intestinal origin,<sup>10</sup> I have had occasion to study a great number of cases of this kind in tropical diarrhoea and sprue. I

have had very favourable results from the use of great quantities of yoghurt and kefir and with the Van der Reis<sup>11</sup> treatment with irrigations of lactic acid bacteria cultivated from the small intestine with extraordinary results.

It is possible that with irrigations of *bacillus acidophilus* the same results may be obtained, but owing to the fact that it seems that *bacillus acidophilus* is most easily cultivated in the faeces, we do not believe that it is capable of remaining as long a time as the bacteria of yoghurt in the small intestine or higher parts of the colon where the therapeutic bacteria are most required.

The lactic acid bacteria which normally live in the higher parts of the intestine constitute possibly the principal defence against the colonie and faecal bacteria, as the experiments of Van der Reis, which I have been able to confirm, have shown. These normal strong intestinal lactic acid bacteria are not easily cultivated in the faeces. As these lactic acid bacteria are normal inhabitants of the small intestine and higher parts of the colon they are now considered very important for therapeutic application.

I shall outline the characteristics of these bacteria, as I found them during my study of them at the Medical Clinie of the University of Greifswald with Professor Van der Reis, and at the Prussian Institute of Milk Bacteriology, Kiel, under the direction of Professor Henneberg, and recently at the laboratory of the School of Agriculture at Oka.

These bacteria, obtained with the bacteriological intestinal tube of Ganther, Van der Reis, and cultivated from the jejunum and ileum in the highest parts of the colon, have the following characteristics: short, small rods which change somewhat in form or as one coccus (*Diplococcus entericus*), both Gram-positive, non-mobile, non-spore-bearing, without volutine, forming sometimes short chains.

In the usual culture media they grow with difficulty. The best media for these bacteria are beer-wort with PH 6.2, beer-wort agar, with or without peptone, in yeast-water, and with decoction of *Thuja occidentalis* (PH 6.2) and *Rhubus Edaceus* (PH 5.2). They grow, as well, in milk whey and lactose culture media acidified with 0.3 per cent of lactic acid.

They grow under aerobic and anaerobic condi-

tions, but more easily under the latter. The colony in beer-wort agar becomes apparent to the naked eye after from two to four days. Its characteristic is its minute size. It resembles little points which have a tendency to cluster; its colour is yellow-grey; its edges are even. In anaerobic cultures the colour of the colony is china-white; the optimum temperature is from 40° to 45° C., but it can also grow favourably at 37° C. It also produces in sugar culture media a great quantity of lactic acid and a small quantity of acetic acid, coagulated and strongly acidified milk and gives it a peculiar, often aromatic, smell, and a fresh acid taste. Dextrose, lactose, maltose and especially xylose and arabinose are acidified, but not cane-sugar. Most acid is produced at a temperature of from 37° to 40°, and very little below 30°. These lactic acid bacteria of the small intestine resist hydrochloric acid even to a concentration of 0.3 per cent.

The *enterococcus acidi lactici* was described by Escherich under the name of *S. ovalis* and by Tadel under the name of *diplococcus intestinalis*. It is probably the same streptococcus which Andrews has cultivated in the faeces under the name of *S. fecalis* and Jensen as *S. faecium*. In old cultures, and by remaining some time in the faeces, it loses its capacity of retaining the Gram stain. It may change greatly in size and aspect or in its capacity to form chains and groups. In glucose agar it forms round grey-white colonies. It grows well in Drigalsky and Endo media, differing from all other streptococci forming red opaque colonies on non-liquefied gelatine; it does not produce haemolysis.

In beef extract, after some days, the sediment takes a mucous character. In litmus milk it reduces to white coagulates, and reddens. The great number of strains of this kind of coccus ferment glucose, galactose, levulose, maltose, lactose, saccharose, dextrin, glycogen, mannite, salicin, raffinose, esculin, and other kinds such as sorbit, arabinose, and inositol. Cultivated in xylose agar it changes its characteristics.

With the elective media, in order to separate it from the haemolytic streptococcus, bile may be employed to advantage, but one of the best points by which to differentiate it is its great thermo-resistance, described by Hudson and MacClog. This streptococcus can resist a temperature of 60°C. for an hour, with PH 7.5.

Most research workers consider this lactic acid intestinal enterococcus to belong to the *S. lacticus* cultivated in sour milk, yoghurt streptococcus thermophilicus. It has the capacity of living permanently in the intestine.

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## An Address

ON

## SICKNESS INSURANCE\*

BY JOHN W. S. McCULLOUGH, M.D., D.P.H.,

Toronto

THE medical profession and the public of eastern Toronto are to be congratulated upon the establishment of this fine hospital serving a large and growing population of the city heretofore unjustly deprived of the necessary facilities for the care of the sick. The growth of institutions of the kind coincides with the steady advance in the cost of sickness in this country, the total of which by careful estimation reaches the enormous sum of 311 millions annually. There are upwards of 60,000 beds in hospitals of all kinds in Canada, the upkeep of which reaches a yearly total of 60 millions. Every increase in hospital beds means an increase in the total voluntary contribution made by physicians to the care of the sick, in the absence of which voluntary contribution hospitals could not exist. It is often pointed out, particularly when the medical profession approaches the government for legislation designed to protect the public against quacks, that that profession enjoys a large degree of protection, that it occupies a preferred position, that the State contributes largely to the cost of the doctor's education, and the opportunity is taken to point out that in return for these alleged privileges the voluntary service of the physician is but

acknowledgment of his debt to the State. It may properly be pointed out in answer to this argument that the earliest of medical legislation—that of Edward I, and later that of Henry VIII in England—as well as subsequent medical enactments down through the centuries, were designed not for the protection of the medical profession but rather for the benefit of the public. The public has the unfounded idea that the service of physicians in the outdoor departments and ordinary wards of hospitals is paid for, and it is a matter of surprise for many persons to learn that all this service is voluntary and unpaid.

In spite of the generous contribution made by the medical profession towards the care of the sick, greater by far than that made by any other body of citizens, and in view of the fact that the public is not even yet receiving the medical and surgical care which the present state of civilization justifies, the question naturally has arisen in this and other countries—How may the medical service to the public be improved?

## SICKNESS INSURANCE

A solution of this problem has been attempted in a number of European countries. Voluntary insurance institutions, introduced into Denmark thirty-seven years ago, have been copied by Belgium, France, Finland, Italy, the

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Netherlands, and other countries. In Denmark the system is carried on by mutual benefit societies and other relief institutions, and in 1925 nearly 1½ million persons, or 57 per cent of the population in that country, were members of sickness associations, and medical attendance including hospital and maternity benefits were provided at a cost of over 4 millions. The International Labour Office of the League of Nations, in its report for 1925 pointed out that the voluntary insurance movement has been found insufficient, and that general and effective protection can only be gained by making insurance compulsory.

The trend of public opinion on the subject may further be observed in the enactment in most countries of Workmen's Compensation Acts for the protection of workers in industrial concerns, the funds being provided by industry and administered by the State, in the establishment of old age pensions, as well as the provision in certain of the provinces of Canada of medical, surgical and dental care in the more remote sections, and in the encroachments on medical practice by health departments. At the present session of the Dominion Parliament, a committee has been taking evidence on the subject of sickness and unemployment insurance. A preliminary report has been made indicating that the subject has found favour with the members of the Committee. This Committee recommended:

(a) That with regard to sickness insurance the Department of Pensions and National Health be requested to initiate a comprehensive survey of the field of public health, with special reference to a national health program. In this, it is believed that it would be possible to secure the co-operation of the provincial and municipal health departments, as well as the organized medical profession.

(b) That in the forthcoming census, provision should be made for the securing of the fullest possible data regarding the extent of unemployment and sickness, and that this should be compiled and published at as early a date as possible.

(c) That the federal government be requested to bring the subject matter of this reference before the next federal-provincial conference; and your committee suggests, when the agenda for such a conference is being arranged, that the provincial governments be invited to send representatives of the employer and employee to discuss the subject matter of this report.

#### NATIONAL HEALTH INSURANCE

In Great Britain in 1913, compulsory health insurance came into operation, and has continued for the last sixteen years. Under the Insurance Act all manual workers and practically all other workers, whose wages did not

reach the then existing tax limit of £160 (now £250) were obliged to insure. The enactment of this legislation came about because it was discovered that people in very considerable sections of the country never received (or at any rate would never pay for) their medical attendance, unless under some contract or lodge practice, just as with us there are thousands of people who, while paying the grocer and other tradespeople, never intend to pay the doctor.

The medical profession of Great Britain, particularly among the members of the British Medical Association, gave strong opposition to the measure and succeeded in having the original Act modified so as to afford free choice of doctor and patient, the administration of medical benefits by local committees rather than by fraternal societies, representation of doctors on local committees, etc.

Under the National Insurance Act the employers of men and the employed make a weekly payment of 5d. each; for women employed the payment is 4d. the employer paying 5d.; these together form seven-ninths of the contributions, the remaining two-ninths being voted by Parliament.

*Sickness Insurance Benefits.*—The four ordinary benefits under the Act are:—(1) Medical benefit; (2) Cash benefits; (a) for sickness, (b) for disablement, (c) for maternity.

After a probationary period the normal sickness benefit for a man is 15/-, for a woman 12/- a week for 26 weeks, and both alike are subsequently entitled to disablement benefit of 7/6 a week, for so long as disablement continues up to the age of 70. The maternity benefit is 40/- for the wife of an insured man or double this amount if she also is an employed person under the terms of the Act.

Medical benefit entitles to medical attendance and treatment, including such medical and surgical appliances as may be prescribed by the regulations. It did not at first include specialist or dental treatment, unless the Friendly Society to which the person belonged gave additional benefits. There has been some modification in this respect in recent years. It includes ordinary attendance in tuberculosis, but does not include attendance in confinement for insured women, the maternity benefit in cash taking the place of this.

*Administration.*—The general administration of the Insurance Act is in the hands of the Ministry of Health whose ministerial head is a layman, while local administration is in the hands of insurance committees upon which the profession has representation, there being a local committee for each county and county borough, or 200 in all for England and Wales. The insurance committees administer the medical benefits, *i.e.*, they are responsible for the medical attendance of all insured persons, while sickness and maternity benefits are administered by the Friendly Societies and by branches of big industrial insurance concerns, that is, they distribute the appropriate sums of money to the insured persons who are sick, to the insured women and the wives of insured men when they are confined.

Every doctor on the British register has a statutory right to be on the panel for the insurance area or areas where he practises, and he can only be removed from that list at his own wish, or after enquiry shows that he is unfit for his position. In England, Wales, and Scotland there are upwards of 33,500 doctors on the register, of whom about 26,000 are in general practice. Of these about 14,000 are actually on the panel, that is, are eligible for insurance practice.

About one-third of the population, or roughly 14 millions of people, are insured and entitled to medical benefit, so that the average number for each doctor is about 1,000. The average attendances of a doctor are 3.8 per insured person, and usually this means one visit to the person, the others being office calls for consultation or a certificate. There is a capitation fee of 9/- per insured person and if his visit is beyond two miles from his office the doctor is paid mileage out of a separate fund. The average fee for attendance is 2/6.

In 1925, the total cost of medical benefit was \$40,242,258, of which \$31,158,131 went to the doctors, and \$9,084,131 for medicines and appliances, so it will be observed that the 13,937 doctors received \$31,158,131 or an average of about \$2,235. In addition the doctor is free to do private practice which, especially in the larger towns, is greater than insurance practice.

Competent observers among the medical profession agree that the system is fairly satisfactory. It has increased the doctor's work

especially at his office. People go earlier for more trifling complaints, which formerly were left untreated or not given sufficiently early attention. It pays the doctor to see cases early; they are more easily cured. The clerical work of certificates and reports, which doctors dislike, is increased.

The doctor's income has undoubtedly increased; he has no bad debts and his pay comes regularly every three months. He has probably lost the income from domestic servants whose bills were formerly paid by the employer. Physicians in industrial and rural areas and particularly in large towns have had an increase in income. The secretary of the British Medical Association says that he doubts if a single doctor on the panel has suffered a decrease in income.

As to the proportion of his time devoted to insurance work the doctor with 1,000 persons on his list would be liable to about 14 items of work a day if he worked 300 days in the year. Of these there would be four visits and 10 surgery attendances. It will be remembered that 1,000 insured persons does not mean 1,000 patients. It really means an average of 3.8 attendances per insured person. While attendances include treatment of fractures, dislocations, minor operations and miscarriages, office attendance frequently means the issue of a certificate. Thus it appears that the doctor has considerable time for private practice.

As to the question of the effect of the system on the morale of the profession, opinions differ, but it cannot be doubted that the security of income, of tenure of position and the large opportunity for private practice should serve to keep up the doctor's status. The system has compelled doctors to work together better; there is less tendency to capture the patients of a neighbouring physician; and while the person may change his doctor he can only do so after notice. The effect on medical research has been the state endowment for this purpose which is under control of the Privy Council.

The effect on the public health is scarcely apparent as yet, but the fact that one-third of the population has a steady medical attendance, that cases are likely to be seen early and by early treatment prevented from reaching more dangerous conditions, is bound sooner or later to reflect itself in a lower incidence of sickness

and lessened death-rate. Eventually there will be a complete clinical record for a large mass of the people, which will be of no small advantage.

Despite certain objections of too much red tape, clerical work, and too little participation by doctors in administration, the profession in Great Britain would scarcely vote to go back to the old conditions. Successive modifications of the Act have made it more workable; certain specialist services have been made available and others will come in the course of time. Altogether the system apparently is working to the advantage of both doctor and patient and has been of great benefit to the Mother Country.

#### HEALTH INSURANCE FOR CANADA

Is a system of sickness insurance or of state medicine practicable in Canada? Before taking up this subject let us enquire if the medical and public health services of the country are satisfactory.

*Medical Service.*—There are wide areas of Canada where the distance from medical aid prevents the existence of anything like an adequate service. This is serious, particularly in respect to the care of the mother in child-birth, and no doubt contributes largely to the high maternal mortality rate.

To persons of moderate means the cost of medical and nursing attention prevents early consultation in what might be called minor illnesses, some of which, for want of a doctor, develop into serious and incurable conditions. Where free hospital services exist these are often abused by people otherwise able to pay, and there are many people who employ and never pay or intend to pay, the doctor. There seems no doubt that the present position of medical service is satisfactory neither to the profession nor to the public.

The public health service is in a much worse situation. There are only about a score of the municipalities of Canada with a satisfactory public health service. Of the 930 municipalities of Ontario, but twelve possess competent health departments. The cost of sickness in Ontario reaches at least 100 millions annually, yet there are less than 2 millions expended by governments and municipalities in preventive health work. The contrast between the amount of money spent on education and that spent to

maintain the health of the population of the province is startling.

Ontario, spending less than 2 millions to control disease, spends over 48 millions annually on education. Which is the more important, a fine education with indifferent health, or good health with a moderate education?

It must be admitted that the medical service of the country both on the curative and preventive side can scarcely be called satisfactory. What is the practical solution? This solution might be reached by: (1) The provision of medical and surgical and dental service by the State to persons earning, as in Great Britain, less than a certain income. (2) Development of the public health service, so as to make it as effective as possible in both urban and rural areas.

*State Medical Service.*—Taking up the first item; it may be repeated that there is already a sort of crude state medicine in Canada. Large corporations have a medical service; the employees of the large industries in New Ontario have for years had a medical service, for which they pay so much per month; accidents in industry are taken care of by the Workmen's Compensation Board; there is treatment of Veteran Soldiers by the Department of Pensions and National Health; a State medical service is under construction in some of the western provinces. A State medical-service would provide the poor with continuous and steady medical attention, relieve physicians of bad debts, hospitals from abuse of the out-patient departments, and establish in the course of time valuable clinical records. The possibility of the establishment of such a service is indicated by the trend of events in parts of Canada, and in view of this doctors should stand on guard to see that they, upon whom the success of any scheme of the kind most depends, should have a fair share in the administration, and a reasonable return for their services. The difficulties in such a wide area as Canada will be greater than in countries with a small area and dense population, but these difficulties may be overcome.

The public health problem can be solved by: (1) a consolidation of local health units; (2) expenditure of larger sums of money; (3) co-operation of the medical profession; (4) education of the people in health.

The 930 health units of Ontario should be consolidated into about 60, each with a whole-time competent medical officer of health and staff, the cost of which, depending on the areas involved, would run from \$10,000 to \$15,000, for a rural area to \$25,000 to \$50,000, for the smaller cities not at present served by a whole-time organization.

The requisite funds should be the joint contribution of Dominion, provincial and municipal governments. If it is good business for the Dominion to spend large sums in the promotion of immigration, it is surely equally good business to protect the health and lives of the native population. Greater expenditure in prevention by provincial governments would eventually relieve the provinces to some extent at least of the ever mounting bills for hospital and institutional care of all kinds, of the expense of old age pensions, of mothers' allowances, etc., much of the latter two being the result of the poverty whose greatest cause is sickness.

Health departments must in the future gain the co-operation of and employ more and more the services of the general practitioner. This co-operation can only be obtained by utilizing and paying for the services of the ordinary physician in general public health work, such as vaccination, inoculation, school medical inspection, baby clinic work, etc., and by removing the competition in practice of the part-time medical officer of health. Finally, the public must be educated in the value to them of health work, and the best place to provide this education is in the schools. A great

opportunity for the spread of health education in the schools is being neglected at present, because in all but a few of the municipalities there is no one at hand to carry on this work. Similarly, a great opportunity is being missed of discovering tuberculosis, heart disease and other affections at an age when most can be done to limit the ravages of affections, which are among those causing the highest rates of mortality.

#### CONCLUSIONS

In view of the foregoing considerations it seems that a State system of health or sickness insurance including an improved public health service is desirable. Such a service would afford:

1. A sense of security in time of sickness on the part of the entire insured population.
2. Medical attention to those not now in a position to obtain such attention.
3. Early recognition and treatment of minor ailments, and the possible prevention of incurable conditions.
4. A clinical record of a large portion of the population.
5. A feeling of greater financial security among doctors who serve the industrial population.
6. A certain assured income.
7. Participation in and remuneration for certain public health services.
8. The spread of health education among the people.
9. Early discovery of children's defects through medical inspection of schools.

METHOD OF ESTIMATING CARDIAC EFFICIENCY.—The aim of a cardiac test was to secure some objective method of estimation which could be used to determine the efficiency of a heart on more than one occasion and by which a second observer could estimate the changes noted by the first. Vague terms and varied opinions made it very difficult to trace the history of a heart through other people's notes. The six factors taken were: reclining pulse-rate, standing pulse-rate, difference between reclining and standing pulse-rate, pulse-rate after standard exercise (touching the toes 20 times), time in which pulse-rate returned to normal, and difference between standing and reclining blood pressures. The fact that the nurse could take the pulse-rate obviated errors due to excitement at the doctor's visit.

A system of marks varying from 3 to -1 was allotted to each test, so that a maximum of 18 could be obtained. Eight marks constituted a pass, 7 was doubtful, and below 6 some cardiac damage was indicated. The test was subject to the fallacies of all numerical tests, but had been based on a large number of cases, and it did give an index by which progress could be gauged from time to time. It was essential that the elements of a test should be obtainable in any bedroom, and elaborate clinical methods were therefore inadmissible. The test was especially useful in those cases where there was a rapid heart but nothing else. The heart that gave a poor response to the test often developed symptoms of damage later on. The scheme was put forward with all reserve and with no claim at all to finality.—*Lancet*, 1929.

## A NEW ANÆSTHETIC GAS: CYCLOPROPANE\*

## A PRELIMINARY REPORT

By G. H. W. LUCAS AND V. E. HENDERSON,

*Department of Pharmacology, University of Toronto**Toronto*

AS is well known, the anæsthetic gas propylene manufactured and tanked by Squibb showed toxic properties which were not evident in the original gas produced in this laboratory. Tests made here with Squibb gas were in accord with observations made elsewhere. The cause of the toxicity was unknown, and while looking up its possible sources one of us (G. H. W. L.) suggested that possibly some cyclopropane might have been produced. We consequently determined to examine this gas.

According to Willstätter, cyclopropane can be made by the reduction of trimethylene bromide by zinc dust in the presence of alcohol and traces of water. The gas produced by this interaction did not consist of pure cyclopropane, but contained a small percentage of propylene, which was absorbed with potassium permanganate. The residue contained from 93 per cent to 85 per cent cyclopropane and 7 to 15 per cent of an unknown gas. As the anæsthetic property might be due to this unknown gas, all the cyclopropane was removed from a large sample by absorption with sulphuric acid, and one or two experiments were performed with the residue. This residual gas was not anæsthetic at all in concentrations up to 40 per cent. It was exploded with oxygen and probably consists of a saturated hydrocarbon and hydrogen. Consequently, the whole gas, less the propylene, has been used throughout our experiments and the percentage of cyclopropane obtained by analysis based on the amount absorbed by sulphuric acid.

Our earliest experiments showed that cyclopropane was a remarkably potent anæsthetic with but slight toxic properties, as may be illustrated by the following protocols and illustrations.

## EXPERIMENT 1

Dec. 3, 1928. A cat of 2 kg., anæsthetized with 15.6 per cent cyclopropane. 2 p.m. Connected to re-breathing respiration recorder ( $\text{CO}_2$  absorbed) and blood pressure recorder from carotid. Blood pressure 135 mm. Hg. respiration rate 32; vol. 60 c.c., min. vol. 1920 c.c. 2.05 Blood pressure 127 mm. Hg. respiration rate 33; vol. 60 c.c., min. vol. 1980 c.c. 2.57. Blood pressure 127 mm. Hg. respiration rate 30; vol. 64 c.c., min. vol. 1920 c.c. Oxygen had been allowed to increase in the last 5 minutes. Gas analyzed gave 9.2 per cent cyclopropane anæsthesia, light surgical. 3.22. Cyclopropane added. New analyses showed 16.6 per cent cyclopropane. 3.27. Blood pressure 95 mm. Hg. respiration rate 27; vol. 42, min. vol. 1134 c.c. 3.35. Blood pressure 72 mm. Hg. respiration rate 33; vol. 32, min. vol. 1056 c.c. Very deep surgical anæsthesia since 3.25 p.m. The oxygen percentage was allowed to fall and cyclopropane was being added. 3.36. Gas analysis showed 22 per cent cyclopropane. 3.52. Blood pressure 45 mm. Hg. respiration rate 27; vol. 32, min. vol. 864 c.c. With a percentage of 27 the blood pressure continued to fall and respiration became more shallow. Anæsthesia was maintained for over one hour with no appreciable fall in the blood pressure and good respiratory volume.

## EXPERIMENT 2

Jan. 3, 1929. A cat of 1.5 kg., anæsthetized with 15 per cent cyclopropane in oxygen. 10.52 a.m. Connected to respiration and blood pressure recorders. Blood pressure 125 mm. Hg. respiration rate 24; vol. 60 c.c., min. vol. 1440 c.c. 11.24. Analysis of cyclopropane 12 per cent, surgical anæsthesia. Blood pressure 115, respiration rate 15; vol. 60 c.c., min. vol. 900 c.c. 11.37. Analysis of cyclopropane 19.5 per cent. Very deep surgical anæsthesia. Blood pressure 140, respiration rate 18; vol. 38 c.c., min. vol. 684 c.c. 11.44. Cyclopropane had been added to give 35 per cent. Respiration very shallow. Blood pressure still 135. The cat was allowed to breathe air for 100 seconds and respiration reconnected. 11.59. Cyclopropane now 27.5 per cent. Blood pressure 135, respiration rate 33; vol. 16 c.c., min. vol. 528 c.c. Respiration gradually failing. 12.08. Cyclopropane now 32 per cent. Blood pressure 100, respiration rate 54; vol. 6 c.c., min. vol. 324 c.c. Blood pressure then fell rapidly. Heart death 4 mins. after the cessation of respiration.

In this experiment respiratory failure preceded the fall in blood pressure, but it will be seen that there is a wide range between the concentration needed for surgical anæsthesia (12 per cent) and the fatal concentration, (27 to 30 per cent).

These experiments, which are typical, show that in cats surgical anæsthesia may be maintained with 10 to 11 per cent of cyclopropane. The percentage required for rabbits appears to

\* Read at the Annual Meeting, Canadian Medical Association, on June 21, 1929, before the Section of Anæsthesia.

be slightly higher, namely 14 to 15 per cent. Toxic features do not appear rapidly, save with concentrations of 18 to 20 per cent in cats, though a fall of blood-pressure of not serious extent may occur with 16 per cent and upwards. Toxic effects may be evident, either in a fall of blood pressure or more usually in respiration becoming shallower and slower.

Recovery from doses toxic to respiration is very rapid, 2 to 3 minutes; if the toxicity has shown itself in a fall of blood pressure the recovery is not so rapid. Recovery of an animal when not operated upon is well shown by the following protocol.

#### EXPERIMENT 3

Feb. 1, 1929. A cat of 1.5 kg. At 1.40 p.m. the animal was placed in an anaesthetizing tank and at 1.55 p.m. a gas mixture of 15.4 per cent cyclopropane in air and oxygen was admitted. The cat slowly sank down, with no stage of excitement, and was apparently deeply anaesthetized in four or five minutes. It did not respond to poking. The respiration rate was 10 to 12 per min. and deep, slightly jerky, with prolonged inspiration. 4.05 p.m. The state was still the same. Analysis showed 13.3 cyclopropane and 30 per cent oxygen. When removed the cat winked and moved its tongue in one minute, sat up, and walked about in three minutes. In five minutes purred when petted. It was quite normal a week later.

In this experiment, as in others to be quoted subsequently, the animals were placed in a large bell jar standing in a trough containing mercury in a plate which served to close the lower end. In the bell jar also was a rubber balloon containing air. The air in the jar was enriched by passing in oxygen. The jar also contained a large surface of moveable soda lime  $\text{CO}_2$  absorber. When the air had been sufficiently enriched, the balloon connected to the outside was deflated and cyclopropane run into the jar to give the required concentration.

The above experiment also showed that there appeared to be no subsequent after-effects. This was shown in other animals also. Further, both rabbits and cats have been anaesthetized at least three times without showing bad after-effects, as may be shown by the following protocols.

#### EXPERIMENT 4

Jan. 22, 1929. A rabbit of 2.5 kg., very fat. Light anaesthesia was instituted for two hours with a final percentage of 10.3 per cent cyclopropane. The animal was reanaesthetized the next day, with approximately 27 per cent cyclopropane for 140 minutes, finally a gas analysis of 18 per cent cyclopropane, and 31 per cent oxygen. Fairly deep anaesthesia was obtained though probably not to the surgical degree. Recovery was rapid, i.e., in 2 minutes. The rabbit was reanaesthetized on

Jan. 25, 1929, for 2 hours. The soda-lime contained did not function properly and moisture accumulated; there was a good deal of salivation; nose bedded in the bladder.  $\text{CO}_2$  at end of experiment was 7.7 per cent; cyclopropane 18.3 per cent; oxygen 26 per cent. Recovery was slow, but the rabbit was apparently all right the next day. When killed, the kidneys, liver and heart were found to be normal.

#### EXPERIMENT 5

May 6, 1929. Five kittens, 6 to 7 weeks old, of a total weight of 1.8 kg., were anaesthetized in the chamber with approximately 11.5 per cent cyclopropane in oxygen and air. Three kittens became rapidly anaesthetized; one moved its head and body throughout, one was intermediate. When taken out after a 75 min. anaesthesia two showed nausea, one deep and one light. Two that went under fastest recovered most slowly (10 minutes were required to walk normally). May 7, 1929. All were reanaesthetized (Kodak gas) with approximately 14 per cent gas of 42 per cent oxygen for one hour. Resistance to anaesthesia the same, but all deeper than before: the most resistant were fairly under. Recovery in all cases as prompt or more so than on the previous day. May 8, 1929. All were reanaesthetized (Kodak gas) with approximately 12 per cent gas. All became completely anaesthetized and anaesthesia lasted for 90 minutes. Finally gas analysis gave 10.3 per cent cyclopropane, 35 per cent oxygen. Recovery was rapid and in the same order. The white kitten always showed nausea; two others once each. May 9, 1929. The intermediate and the one least resistant were killed; no pathological change was found. The others died in 4 to 5 days, but death seemed to be due to inanition (they had at no time eaten well). The livers and other organs were normal histologically.

Several experiments have been performed in which blood analyses were made in order to follow changes in metabolism. Our results in the experiments carried out thus far can be summarized as follows.

June 3, 1929. Cat, 1050 gm., 1.25 p.m., Ph. 7.42;  $\text{CO}_2$  36.9; blood sugar 0.189, 2.35 p.m., Ph. 7.40;  $\text{CO}_2$  43.5; blood sugar 0.197, 3.10 p.m., Ph. 7.35;  $\text{CO}_2$  44.5; blood sugar 0.187. June 4, 1929. Rabbit, 3.2 kg., 10.28 a.m., Ph. 7.45;  $\text{CO}_2$  53.8; blood sugar 0.152. 11.43 a.m., Ph. 7.55;  $\text{CO}_2$  65.3; blood sugar 0.160. June 7, 1929. Cat. 2.5 kg., 1.40 p.m., Ph. 7.55;  $\text{CO}_2$  38.6; blood sugar 0.173. (Somewhat toxic, sample; low blood pressure). 2.40 p.m., Ph. 7.35;  $\text{CO}_2$  46.3; blood sugar 0.236. 3.17 p.m., Ph. 7.35;  $\text{CO}_2$  47.2; blood sugar 0.219.

These figures show a slight rise in Ph and  $\text{CO}_2$ -combining power, with little change in the blood sugar, save in the last case where there was but slight change after the second sample. Owing to a technical accident the cat struggled for a period of two minutes soon after taking the first sample, and this probably accounts for the change in the blood sugar. The rise in Ph and  $\text{CO}_2$ -combining power looks like a blowing off of  $\text{CO}_2$  and in all these cases the respiratory volume remained high and  $\text{CO}_2$  was completely reabsorbed. The resistance of the recorder leads, as may be seen, to a somewhat forced breathing and probably explains this change. The figures for Ph and  $\text{CO}_2$ -combining power

remain more normal than with any other anaesthetic. The gas inhaled in all these cases was high in oxygen (50 to 70 per cent). The same apparatus was used in these experiments as in our previous ones with propylene in which  $\text{CO}_2$ -combining power and Ph fell.

The solubilities in oil and water of cyclopropane were determined by shaking a weighed quantity of oil or of water with a measured quantity of cyclopropane in a constant temperature bath at 35° C., until the gas volume became constant at constant pressure. One cubic centimetre of olive oil (sp. gr. 0.920) dissolved 103.5 c.c. of cyclopropane, while 1 c.c. of water dissolved approximately 0.160 c.c., giving an oil water ratio of 64.4 at a temperature of 35° C. This compares favourably with nitrous oxide (2.8); ethylene (13.2); acetylene (2.1); ether (2.5).

In summarizing we can state that the best cyclopropane we have had appeared to be an anaesthetic with a high potency, some 10 to 12 per cent producing deep surgical anaesthesia in cats. In higher percentages there is a decrease in respiratory depth and frequently in rate, and in some cases a fall in blood pressure. Respiration fails before the heart and circulation. Indeed, the heart seems to be but little affected, as we have tested its activity by injecting adrenalin after respiration had become very shallow and obtained a prolonged rise in blood pressure of normal height, and asphyxia also causes a typical rise in pressure. In no case did the heart not show a high degree of efficiency. The fall in blood pressure appears to be of vasomotor origin. Temporarily in some experiments irregularities have appeared on the blood pressure tracing which appeared like missed beats when a high concentration of cyclopropane was used. These, however, disappeared in all cases and the heart became normal. They also failed to appear later in the same experiment when the concentration was again raised. It is possible they were artefacts, but subsequent study will be undertaken in regard to this point. Recovery appears to be prompt and with little after-effects. Metabolic effects appear to be slight or absent.

The first cyclopropane with which we experimented was made from a sample of trimethylene bromide obtained from Schuchart & Co. This sample was water clear, and 90 per cent

distilled between 161-3° C. This small supply was rapidly exhausted, and we obtained a further supply of the bromide from the Eastman Kodak Co. This sample was yellowish in colour, began to distill at 110° C., and distillation was not complete at 170°. Only some 60 per cent distilled between 161-165° C., and this only was used. Unfortunately, this gas seemed to have some toxic qualities absent from the first. Blood pressure seemed to fall more after deep surgical anaesthesia was reached and salivation appeared to be more marked. We think that prolonged standing over a permanganate solution decreased this toxicity.

We have recently prepared cyclopropane from a third source of trimethylene bromide which appeared to be of a good quality though not so good as the first. Again, the freshly prepared gas required higher percentages to produce anaesthesia; blood pressure was at no time high and tended to fall to half its normal value at deep surgical levels; and also a good deal of tracheal mucus was produced. The same gas, however, after standing over permanganate solution for twenty-four hours was distinctly more potent and there was no mucus produced, and blood pressure was very resistant; even 30 per cent which made respiration very slow and shallow left the blood pressure almost unaffected. However, with this later gas there appeared an increase in flexor tonus in the hind limbs; the limbs resisted extension and after severe stimulation of the femoral nerve showed a contraction, even when the effect of stimulation on blood pressure was almost completely absent, and on respiration very slight, and the corneal reflex had long been absent.

In view of these technical difficulties, which are not as yet completely settled, and as some of the experiments reported above were made with samples of gas which were by no means of the best quality, we feel that this is to be regarded as a preliminary report only, and the conclusions we have drawn in regard to solubility and as to the anaesthetic qualities of the gas must be regarded as tentative only.

Cyclopropane has a sweetish smell, like a mixture of chloroform and ethylene. It is heavier than air and is explosive in 5 per cent and upwards in oxygen. With air it does not explode in mixtures above 10 per cent.

## THE ACUTE GASTRO-INTESTINAL DISORDERS OF INFANCY\*

By S. G. Ross, M.D.,

*Montreal*

I HAVE chosen for the subject of my paper a common ailment: not a new or rare condition, but one which is with us from day to day and especially in the hot days of summer. It would seem advisable at times to review well-worn subjects in order to evaluate new facts or theories. In a limited way I have attempted to do this and have taken as a basis for my remarks the study of a group of 59 consecutive cases of acute gastro-intestinal disorders admitted to the Paediatric Department of the Royal Victoria Hospital during a period of two years. Any conclusions, then, drawn from the series, must be modified in a general outlook, as they naturally deal only with the serious cases which required hospitalization.

## THE AGE FACTOR

The digestive system of a child, and especially that of infants, is peculiarly liable to disturbances in function. Any insult to the digestive tract at this age may result in an acute gastro-intestinal disorder. The reasons for this are not entirely clear. In the series of cases studied, we note that 51 out of 59 occurred in the first year of life and only 8 in the second year. After two years of age, it is rarely that we see cases of acute digestive disorder severe enough to require hospitalization.

## ETIOLOGY

The etiology of these disorders has long been and still is a moot point. However, certain facts stand out.

*Malnutrition* is undoubtedly a predisposing cause. The mal-nourished infant has a diminished digestive tolerance often resulting from a previous digestive disorder. In our cases only 9 were of normal weight; the remainder were definitely or markedly underweight. We look upon malnutrition as the most important predisposing cause.

*Breast-feeding*.—The failure of a mother to nurse her child is the other important predisposing cause. The type of feeding used in

these cases is illuminating. Fifty-six were artificially fed, two only were breast-fed, while one was on "mixed feeding." These figures alone illustrate the supreme importance of breast-feeding in preventing gastro-intestinal disorders. In many of these infants there was a history of failure to gain properly after weaning, with resulting malnutrition.

*Direct Causes*.—These may be classified under three headings in the order of their importance: (1) Summer heat. (2) Infection. (3) Improper feeding. It is a well-known fact that the high peak of incidence of the disorders is usually in the middle and end of the summer months. In our cases, 12 occurred in July, 27 in August and 11 in September, that is, 50 out of the total 59 cases. I shall discuss the probable reason for this later.

*Infection*.—The influence of infection of any type in causing gastro-intestinal disorders is recognized and has been possibly over-emphasized of late. These infections may be either enteral or parenteral. I have made an attempt to estimate the part played by infection in this series. In the 59 cases, no primary infection was found in 35 cases, whereas in 24 a definite infection was present as a probable cause of the disorder. Otitis media was the commonest infection, and this finding, I think, is borne out by all observers. I have carefully eliminated in these cases all infections arising during the course of the illness, because it is well known that during acute gastro-intestinal disorders, especially in malnourished infants, infections of all kinds may intervene. These, however, should be considered as secondary to the disease rather than the causal agent, although they do, in turn, have an adverse effect upon the course of the disorder.

During the past four or five years Marriott and other workers have emphasized the rôle of mastoid infection as a cause of many of the acute digestive disorders of infancy. They claim that with infection of the middle ear, the mastoid is often involved. In many cases there is no external evidence of mastoid infection. On opening the mastoid antrum, either on the operating

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From the Department of Pediatrics, the Royal Victoria Hospital, Montreal.

table or at post-mortem, pus has been found. They advise antrotomy of the mastoid bone under local anaesthetic in cases where mastoid infection is present or suspected. By this means, the infection causing the secondary gastro-intestinal disorder may be overcome and the patient recover. Our experience on this subject has been limited. The post-mortem table will often reveal infection of the middle ear and mastoid in marasmic infants. We should, however, bear in mind that this may be a terminal infection like bronchopneumonia. On the other hand, when an acute otitis media appears to be the causal factor in an acute digestive disorder, the mastoid antrum is sometimes involved. If the patient does not respond to treatment after paracentesis of the drums, antrotomy would be permissible under local anaesthetic. We have had several recoveries in such cases where the drainage of the mastoid seemed to be the deciding factor. In the majority, however, the course of the disease was uninfluenced by this operation.

*Improper Feeding.*—Over-feeding, too frequent feedings, feeding a food too rich in one element, e.g., carbohydrate, may all cause acute gastro-intestinal disorders. The feeding of stale milk, containing the irritating products of fermentation and putrefaction, may also upset the digestion. With the comparative purity of our present-day milk supply, this factor is not as important as it was formerly.

One might summarize as follows: The vast majority of these cases occur in the summer months. In artificially-fed infants who are under-nourished, a continuous high atmospheric temperature and humidity lowers the digestive capacity or tolerance of the infant. Under such circumstances, any improper feeding results in an acute digestive disorder.

The opposing view that the ordinary so-called "summer diarrhoea" is infectious is not proved, to say the least. There is undoubtedly a group of these due to intestinal infections, such as bacillary dysentery, possibly certain strains of streptococcus, and occasionally the typhoid group. Unless, however, we are prepared to accept the hypothesis of some unknown virus or organism as a causal agent or to assume that the ordinary bowel saprophytes suddenly become pathogenic and produce toxins, it seems more reasonable to accept the former theory. Some support is given to this by our figures, which show that in only four

cases were pathogenic organisms found in the stools of these infants. In a large series of cases, this has been the experience of other workers. The parenteral infections, however, do seem to play a very important part in causing these disorders. Their toxins act on the cells of the digestive tract, lessening secretion, causing gastric stagnation and thus disturbing digestion, with resulting vomiting and diarrhoea. Such parenteral infections would obviously be more serious in marasmic infants during the summer months.

#### CLASSIFICATION

The classification which we have adopted is a simple one based on the clinical picture. These cases are sub-divided into two groups. (a) acute gastro-intestinal indigestion, 48; (b) acute gastro-intestinal intoxication, 11. The second, to my mind, is not a separate disease but merely an advanced stage of the first. However, in it we get a fairly constant set of symptoms which entitle it to separate consideration.

#### SYMPTOMS

The characteristic onset is a sudden anorexia, usually accompanied by vomiting, almost invariably with diarrhoea. Fever is present in most cases, and colic is often present. If refusal of food persists along with vomiting and diarrhoea, the infant, who is more hydrolabile than the adult, shows signs of dehydration as a result of the loss of fluids. The skin loses its elasticity and, on being pinched up into a fold, does not immediately flatten out. In our cases, diarrhea was present in all, vomiting in 38, and fever in 42 cases. In the severe cases, the so-called gastro-intestinal intoxication, certain features are added to the picture. The dehydration is severe, the eyes are sunken, the fontanelle depressed, the nose pinched, and the whole skin may have a shrivelled appearance. As a result of this dehydration, the circulation is poor. The blood volume and blood flow are lessened. Cyanosis, especially of the extremities, results; the hands and feet are cold although the temperature may be very high. Anuria is also present, probably as a result of the impaired circulation. The intoxication is indicated by drowsiness, often passing into coma, the patient has a mask-like stare and is barely conscious of his surroundings; he makes few movements. Occasionally convulsions oc-

eur. The third cardinal symptom is acidosis. Although not always present, it occurs frequently. The diagnosis is easily made clinically by the deep, pauseless respirations, (Kussmaul's air-hunger), which is pathognomonic. It is sometimes of the ketone-body type of acidosis but usually not. The pathogenesis of this type of acidosis is not settled but there is evidence that it is due to the failure of the kidney to eliminate normal acids of metabolism, such as phosphoric, and abnormal acids, such as lactic acid. Sometimes it is due to a proportionately greater loss of base from the blood than acid.

#### DIAGNOSIS

This usually offers no difficulty. It is important, however, to make a general examination in order to decide whether we are dealing with a primary gastro-intestinal indigestion or one secondary to infection. If, for example, an otitis media or furunculosis be present, prompt treatment of these is essential. In all cases of acute digestive disorder in infants, especially with fever, the ears should be examined. The diagnosis of enteral infection is usually easy. Any infant suffering from a bloody diarrhoea, especially when associated with the presence of pus in the stools, is suffering from an infective entero-colitis. In nearly all these cases, the infecting organism is one of the bacillary dysentery group. Amœbic dysentery is practically unknown in this country. Careful bacteriological studies will usually reveal the infecting micro-organism. It must be remembered that occasionally in intussusception the infant passes frequent small stools containing very little but mucus and blood. The differential diagnosis could be made from the history, the presence of the tumour, and the absence of fever in intussusception. Typhoid fever in infants sometimes shows acute gastro-intestinal symptoms. During the epidemic of 1927, an infant of nine months was admitted with a diagnosis of acute gastro-intestinal indigestion. It was suffering from typhoid fever.

#### PATHOLOGY

There is nothing characteristic in the stomach and bowel in this disease. The only exception is that in the true intestinal infections, such as dysentery or typhoid, the lesions of these diseases will be found.

#### PROGNOSIS

The prognosis depends upon a number of factors. Breast-fed infants do better than those artificially-fed for three reasons: (1) They are getting a food which is usually easier to digest than any artificial feeding. (2) They have a greater immunity to infection than artificially-fed infants. (3) They are less frequently mal-nourished or marasmic.

The most important factor in prognosis is the nutrition of the child. The marasmic infant is the one which goes to the wall during an acute digestive disorder. The second important factor is the time of year. The majority of deaths occur during the hot summer months. At this period, the infant dies of inanition, usually with terminal infection, because the digestive system cannot tolerate sufficient food to sustain life. The prognosis in the cases secondary to infection is worse than in the non-infectious cases. We had 13 deaths in our series. Of these, 8 were in cases following infection, i.e., a percentage of 33; whereas in the non-infectious cases the percentage mortality was 14. In the severe form of the disease, i.e., the gastro-intestinal intoxication, the mortality is very high, varying between 25 and 75 per cent. In our series, the mortality in acute gastro-intestinal indigestion was 17 per cent, whereas in acute gastro-intestinal intoxication it was 45 per cent. The total mortality was 22 per cent.

#### PREVENTION

The acute digestive disorders of infancy and the consequent mortality are steadily decreasing. They still, however, account for about one-third of the mortality of the first year of life. The chief reasons for the reduced incidence have, I think, been the improved methods of infant feeding and hygiene, and for this improvement too much cannot be said for the numerous health centres for the poor of the city, where mothers are given instruction in the proper feeding of their infants. The education of the public to the importance of keeping an infant in a good state of nutrition will do more than anything else to further reduce the incidence of this disease. Other factors in prevention are the insistence on a good milk supply and the elimination of feeding poorly-balanced foods such as sweetened condensed milks.

## TREATMENT

At the onset of the disease, a thorough purge with a drachm of castor oil is of value. This, however, should not be repeated after the first day. By that time, nature has done its work.

Stop food for a period varying from 6 to 48 hours. This depends upon the severity of the symptoms. A good general rule is to start food when the infant stops vomiting water.

Supply fluids. The fluids lost from the body through vomiting and diarrhoea must be replaced, as many of the symptoms result from dehydration.

Water, plain or sweetened with saccharin, may be given every hour. Persist even if vomiting occurs. In the mild cases, this is sufficient. If, however, dehydration is obvious, it is necessary to supplement this by other methods.

Hypodermoclysis with 5 per cent glucose in normal saline. This supplies salt as well as water and some sugar to combat the ketosis if present. Some clinicians give 10 per cent glucose, but we have found that it is not absorbed so well. It may be given in amounts of 100 to 125 c.c. twice or even three times daily, depending upon the rapidity of the absorption.

For rapid absorption in the severe cases, the intraperitoneal injection of normal saline is efficacious. It may be given in amounts varying from 250 to 300 c.c. at a time. With certain precautions, it is without risk.

In the very severe cases, the intravenous injection of 10 per cent glucose in saline seems to be of definite value in improving the general condition, including the patient's circulation. The technical difficulties of intravenous therapy in infants are one of the objections to its use. Rectal salines are of little or no value on account of the irritability of the bowel, which prevents their retention. At times we have used the nasal drip method of introducing fluid into the stomach where vomiting is persistent.

The results of sufficient fluid administration are usually striking. The patient becomes brighter, the colour and circulation improve, the kidneys begin to function and the toxic symptoms are abated. The acidosis usually disappears, probably as a result of the improvement in the circulation and the restoration of kidney function. In the grave cases, this improvement may be only temporary, and unless the digestive function is restored, the child will finally succumb.

**Feeding.**—Only the general principles can be outlined here and a few examples of specific feedings given.

1. Start feeding after the toxic symptoms have abated and the vomiting has ceased.

2. Begin with a small amount of food, e.g., half an ounce at a time and increase regularly by this amount unless severe vomiting occurs. Feed every three or four hours. The interval depends upon the individual case.

3. Start with a 5 per cent cereal gruel, such as rice or barley.

4. As the infant's tolerance for fat and carbohydrate is low, the first milk added to the cereal gruel should be skimmed or partly skimmed. The first carbohydrate added should be dextrimaltose or corn syrup, that is, a sugar which is less easily fermentable than cane sugar or milk sugar.

5. The use of a milk acidified with lactic acid, either naturally as buttermilk, or artificially as lactic acid milk or protein milk, has been found to be usually more suitable than the use of sweet milk in these cases.

First day.—Water every hour.

Second day.—Barley gruel every 3 or 4 hours.

Third day.—Skimmed lactic acid milk + barley gruel + 2½ per cent dextrimaltose every 3 or 4 hours.

Later.—2 per cent lactic acid milk + barley gruel + 5 per cent dextrimaltose every 3 or 4 hours.

One point requires emphasis. Too often in the past these infants have been starved through treating the diarrhoea rather than the baby. In curing the diarrhoea, the baby has been starved to death. If the infant is taking its food well and has stopped vomiting, the increase in the feeding must not be stopped because the stools remain somewhat diarrhoeal. To do so is often to court disaster by starvation.

**Infection**—Any infection must receive prompt attention. The most striking results are seen in the treatment of otitis media by early incision of the drum membrane. The opening of furuncles or abscesses is important. Unfortunately, many of the infections such as pneumonia, dysentery, and others, do not respond well to treatment, and it is these cases which so frequently die. The serum treatment of dysentery in infants is useless and the mortality in these patients is very high.

Two examples may be cited, illustrating the relationship of parenteral infection to these disorders and the result of treatment.

## CASE 1

An infant, 3 weeks old; birth weight 5½ lbs. Breast-fed for 8 days; complementary feedings for the next week. At 16 days severe vomiting and diarrhoea began, which necessitated admission to the hospital. The child was acutely ill; temperature 100°; collapsed, dehydrated, cyanosed, weight was 4 lb. 1 oz. The pharynx and left drum membrane were reddened. It was given intravenous salines and transfusion. On the following day, vomiting persisted. Both ear drums were reddened and left ear bulging. The drums were incised. Pus was obtained from left drum. Tempera-

ture 102.2°. Following this, there was immediate cessation of symptoms and steady recovery. The baby was discharged after three weeks, having gained two pounds. This was a typical case of acute gastro-intestinal intoxication secondary to infection of middle ear.

#### CASE 2

An infant, 3 weeks old; birth weight 8½ lbs. Weaned at 12 days, and did well on artificial feeding. At the age of 2 weeks, it developed double mastitis. Pus formed in left breast and drained spontaneously. At the age of 3 weeks, the other breast showed more inflammation. The infant suddenly collapsed, developed loose stools, but there was no vomiting. On admission, it showed marked dehydration, cyanosis, and some spasm of the lower jaw. The condition improved following administration of fluids. Two days later the baby became toxic again. The temperature rose to 102°. There was definite fluctuation in the left breast. The part was incised and about a dram of pus obtained. Recovery after three or four days. Diagnosis: Acute gastro-intestinal intoxication (secondary to infection of breast).

#### TREATMENT

*Drug Therapy.*—I do not know of any drug which is of value in controlling the diarrhoea in the disease. Opium, bismuth, charcoal, kaolin, chalk, and many others, have been tried with indifferent success. If the infant is in pain, especially in the cases of dysentery with severe tenesmus, small doses of paregoric are useful, rather as sedatives than to control the diarrhea. In the mild cases in older children the use of a bismuth chalk and opium mixture is sometimes of value.

*Fever.*—This is due to two causes: (1) dehydration; (2) infection. The fever of dehydration is best treated by the administration of fluids and quickly drops when the water balance has been restored. The fever of the infection should be treated by hydrotherapy when it is very high, e.g., cool sponges, or, in cases of hyperpyrexia, cold packs.

*Blood Transfusions.*—During the past four or five years, blood transfusions have had an extensive vogue as a method of treatment in these cases. There are those who claim that, in the severe cases of this disease, especially those with gastro-intestinal intoxication, they are an almost indispensable adjunct to our other methods. Our experience in this has been somewhat different. We have transfused a large number of these cases in the past two years. My impression is that it has its chief value in a certain type of case and at a certain stage in the disease. In the anaemic, malnourished infant who has pulled through the acute toxic stage of the disease and then becomes stationary, transfusions of 75 to 125 c.c., repeated at intervals of a week, do seem to have a definitely tonic effect in starting the infant on the road to recovery. Like most new remedies, their value has been over-rated.

#### A FEW OBSERVATIONS REGARDING LIGHT THERAPY\*

By W. A. JONES, M.D.,

*Radiologist, Kingston General Hospital,*

*Kingston*

MY paper will not be a long one and to most of you the subject matter may not be new. It contains only a few scattered observations made during the last few years. My excuse for writing it is that I found it necessary for my own good to make certain inquiries into the physics of light in order that I might apply the proper principles in treatment, and I now want to pass this information on to anyone who may chance to require it. Please understand that previous to this I had been endeavouring to treat patients intelligently, and not in a hit and miss manner. Unfortunately, however, the medical literature on light therapy abounds in in-

accuracies, and one does seem to absorb so easily that which is incorrect. That I am not alone in this unselective absorption I am sure. In fact, recent articles by medical writers convince me that others have the same trouble, for I see in these articles that the authors have swallowed and assimilated some of the same undesirable misinformation.

One of the least innocuous of these errors has to do with ultra-violet therapy. For a number of years certain ideas have been prevalent on this continent that seek to distinguish between two types of mercury vapour ultra-violet ray generators. It has been supposed that the water-cooled mercury vapour lamp and the air-cooled mercury vapour lamp produce different qualities of ultra-violet radiation. It has been stated that

\* Presented at the meeting of the Section of Radiology and Physical Therapy of the Canadian Medical Association, June 21, 1929.

the former possesses a spectrum dominant in the short ultra-violet, and the latter a spectrum dominant in the long ultra-violet region. It has been further stated that the air-cooled lamp, when used at a distance of forty inches and operated at 70 volts irradiates the skin with long wave ultra-violet intensity, the short ultra-violet waves being filtered out by the atmosphere, and that the water-cooled lamp must be operated at 50 to 60 volts, and at a distance not greater than seven inches, in order that the short wave radiation be not filtered out by the air.

These facts are "interesting if true." If they are true, it means that by using a particular type of lamp, at a certain distance, we may expect to obtain certain more or less desirable clinical results, consistent with the special group of ultra-violet wave lengths employed. As a matter of fact many men in this country are using these lamps in this special way and are interpreting their results in the light of the premises just stated. Indeed, so widespread are these beliefs that I consider time expended in refuting these claims as well spent.

It was in order to test the truth of these statements that I began an investigation of this matter. I may state that I am indebted to Prof. J. K. Robertson and Mr. W. H. Zinn of the Department of Physics, Queen's University, for assistance in making this investigation. We make no claim for originality in this, we simply re-examined and are restating certain physical facts.

For this purpose we used two well known makes of air-cooled mercury-vapour quartz lamps, and also two equally well known makes of water-cooled mercury-vapour quartz lamps. We operated one air-cooled lamp at voltages of 70 and 110 and made spectrograms at tube plate distances of 22," 40" and 55." Using the same tube plate distances we operated one of the water-cooled lamps at voltages of 60 and 95. The other air and water-cooled lamps were not equipped with voltmeters so we did not record the voltage, but we used them at their ordinary treatment intensity, and the spectrograms were made at the same tube plate distances as in the case of the other lamps.

Our results in brief are as follows:

1. Neither distance, voltage, nor the type of lamp used produced any difference in the quality of the spectrum, in so far as the number

and kinds of the different groups of wave lengths are concerned.

2. Qualitative examination showed no variation in the relative intensity of the different wave lengths on any of the plates.

These findings are extremely interesting for a number of reasons.

As there is no difference between the spectral qualities of the air-cooled and water-cooled types of ultra-violet mercury-vapour lamps it is not necessary to possess both in order to procure the complete range of ultra-violet therapy. An air-cooled type of lamp fitted with the necessary accessories is sufficient to meet the needs of the man who does a limited amount of ultra-violet therapy. If, however, the extent of an individual's practice demands it, the water-cooled type of lamp is undeniably handier for certain methods of official treatment. The point to be stressed is that the clinical effect of both lamps is the same.

As the distances and the voltages used make no difference in the spectral qualities, that is to say, if the greater distance does not filter out the short ultra-violet rays, and if the greater voltage allows the generation of the same short ultra-violet rays, it follows that if we use our lamps at the highest voltage consistent with the durability of the burner, and at the shorter distances, our treatment time can be halved and quartered without changing the type of ultra-violet wave lengths used.

These two reasons are from the standpoint of saving of time and money not altogether unimportant, but there remains a third reason which is even more important, because it involves the question of progress. It is this. As there is no difference in the spectral qualities of the two types of lamps, and as voltage and distance produce no changes in these spectral qualities, it is evident that any technique which aims at using for treatment definite groups of ultra-violet wave lengths must evolve along another line.

Many were deceived by the specious arguments previously enunciated, and fondly imagined that they were experimenting with long and short wave length groups. Many have been satisfied to use the combined wave lengths and have not sought further.

That there are different biological reactions to the different groups of ultra-violet rays

there can be no doubt. These reactions demand a great deal of study and much is to be learned concerning them.

For practical purposes it seems logical to divide the ultra-violet field into two groups; the first group to include those rays as low as 2800 Angström units, just below the lower limit of sun ultra-violet; and the second group to include the wave lengths below 2800 Angström units. This can be done readily by means of relatively inexpensive filters. A solarized sheet of one of the ultra-violet transmitting glasses will serve to cut out the short rays and a chlorine gas filter will pass the short wave lengths and cut out the longer ones.

When a large number of us begin to use these filters and record our observations we are going to find out many interesting things. How many of these will be of practical importance, only time will tell. In the Department of Radiology of the Kingston General Hospital, we have carried out a series of exposures on the skin of a number of medical students. We made no attempt to estimate general effects, but concerned ourselves solely with local skin reactions. Our observations are not spectacular, but they are interesting.

For convenience, we used a water-cooled type of lamp, and the filters were such as described previously. In this way we were enabled to radiate areas of skin with either long ultra-violet rays (above 2800 A.U.) or short ultra-violet rays (below 2800 A.U.). We ascertained the length of time of exposure necessary to produce equal degrees of erythema, as observed twenty-four hours after radiation, and with this erythema dose as a basis we made certain experiments, some of which were carried out over a period of several weeks. The summary of our findings is as follows:—

1. Exposure to short ultra-violet radiation produces an erythema more quickly than when the subject is exposed to long radiation. The tanning effect of short radiation is very much less, however, and soon fades, leaving normal white skin, while the area treated by long radiation remains deeply tanned. This fact may be of some importance if applied to further inquiry into the systemic effect of ultra-violet radiation.

2. Contrary to a very prevalent belief, the ordinary light oils, even in a thick layer, have

very little effect in intercepting the rays. We used olive oil, castor oil, liquid paraffin and glycerin. With equal exposure to the long rays we could find no difference between the erythema produced on bare skin and that produced on the skin covered by these oils. In the case of short ultra-violet radiation there was a slight difference, the oils cutting out a small percentage of the radiation, as estimated by the resulting erythema. Soft paraffin, earron oil, lanoline and boracic acid ointment however appeared to cut out practically all the radiation, and no erythema was produced even after long exposure. A knowledge of this is useful in the treatment of various skin conditions requiring dressings.

3. Mercurochrome painted on the skin in solutions of 2 per cent, 5 per cent and 10 per cent intercepted an appreciable amount of the radiation, and this intercepted amount was found to increase with the strength of the solution used. In general, it is necessary when using the long rays to give an exposure from two to four times as long as that required to produce an equal erythema on bare skin. Short-wave radiation seemed to penetrate the mercurochrome more easily as shown by the skin reaction. Those using mereurochrome as a preliminary to ultra-violet radiation in certain conditions should take this into account in estimating the dosage.

4. Other experiments with filtered ultra-violet light are in progress, but as yet there is nothing to report.

Another source of error that is worthy of note is that which concerns infra-red radiation. The trash that has been broadcast by a certain few commercial concerns has unfortunately added greatly to the ordinary medical man's understanding of this field of radiation. Recently, however, several good articles have been published which are helping to clarify the matter, and it is to be hoped that a better understanding of the principles involved in this type of therapy will be more generally acquired.

There are to-day a great many men who have been taught to believe that below the frequency of the ultra-violet, the longer the wave length the greater is the penetrating power of the ray. In accordance with this belief they are discarding the visible light generators, and are acquiring different kinds of the non-luminous, or "black body," type of infra-red generators, in

an effort to procure deeper and deeper penetration. In the achievement of this very estimable desire they are being ably aided and abetted by the "go-getter" type of salesman. The unfortunate part of it all, however, is not that they acquire these particular appliances, but that they interpret their clinical results in the light of their misinformation. I do not at this time wish to comment as to the relative value of the "black body" type or the visible light type of generator. They both produce heat, either in the skin or under the skin, and in the light of our present knowledge it is difficult to say definitely that one is superior to the other. It may be that each has a distinct field of usefulness. The point that I wish to stress is that the man who uses either kind of generator should interpret his clinical results in the light of the now available information concerning the relative penetrative qualities of the infra-red and visible rays, and of the kind of ray produced by the two types of generators.

A very brief summary of such information is as follows:

1. Regarding penetration.—The visible light rays beginning at the violet show a more or less gradual increase in their power of penetration of human skin as the red end of the spectrum is approached. About 25 per cent of blue rays are passed, as compared to 40 per cent of orange rays and nearly 60 per cent of red rays. From this point downward the skin becomes less

permeable, infra-red rays at 8000 A.U. passing only to the extent of 50 per cent. After 15,000 A.U. the infra-red waves begin to be more strongly absorbed by the skin and wave lengths beyond 30,000 A.U. have little power of penetration.

2. Regarding generators.—(a) *Luminous.* Carbon arc and mercury-vapour lamps give off a large amount of infra-red radiation in addition to ultra-violet, but are not used primarily for their heat value. Tungsten and carbon-filament lamps are rich in the visible and near infra-red fields. The tungsten-filament lamp, known as the blue-daylight bulb, delivers a spectrum dominant of 9,000 to 10,000 A.U.

(b) *Non-luminous.*—These generators contain dark bodies heated by electrical resistance to a point just below that at which they would glow, or which glow a dull red and are not sufficiently luminous to be classed as luminous generators. The spectrum of these generators is dominant of 30,000 A.U. and below.

One can, therefore, choose a luminous generator dominant in the visible and near infra-red region and relatively penetrating, or a non-luminous apparatus dominant in the far infra-red region and relatively non-penetrating. In the first case heat is formed relatively deep in the tissue, and in the other event superficially. One can choose the type of apparatus desired for the specific effect.

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There are three vitamins with which we are quite familiar as regards their source and the important rôle they play in nutrition. These are A, B, and C. There are two others concerning which there is still something to be learned, D and E.

VITAMIN A, or the anti-rachitic or anti-ophthalmic vitamin, is found most plentifully in cod liver oil, butter, whole milk, the yolk of the egg and all green leafy vegetables such as lettuce, spinach, cabbage and cauliflower.

VITAMIN B, or the anti-neurotic and growth-promoting vitamin (so called from its absence being responsible for the disease known as beriberi, which disease, fortunately, is for the most part limited to the East) is found most plentifully in cabbage, cauliflower, lettuce, celery, green peas, spinach, potatoes, whole milk, etc.

VITAMIN C, or the anti-scorbutic vitamin (so called because its absence is responsible for the developing of

scurvy and a generally arrested growth) is found most plentifully in the various citrus fruits such as oranges, lemons and grapefruit, and also in tomatoes as well as in all green leafy vegetables.

VITAMINS D and E practically have their source in vitamin A, and are in a sense offshoots of that vitamin. D is particularly emphasized on account of its powerful anti-rachitic properties, or its power to prevent rickets and, if the disease is discovered early, to cure it. It is most abundant in cod liver oil, also in whole milk and the yolk of egg.

VITAMIN E, through extensive tests on rats and mice, has fully demonstrated its efficiency in conferring fertility for reproduction. This vitamin is found in greatest abundance in the oil of the germ of wheat and in the germs of various seeds, as well as in the yolk of the egg and in most green leafy vegetables.—*Health Bulletin*, Toronto, March 23, 1929.

ON THE POSSIBILITY OF RELIEVING ABDOMINAL PAIN BY SECTION OF  
THE SYMPATHETIC RAMI COMMUNICANTES\*

By F. A. C. SCRIMGER, B.A., M.D.,

Montreal

THERE are a good many instances of abdominal pain for which no obvious explanation can be given by reference to any definite lesion. Such patients we have all seen; many of them have been operated upon many times; and at each operation something has been taken away, as a certain famous surgeon once said, "not a normal appendix mind you." They then may be classed as "neurasthenic," if no stronger expression is employed. By such a label we not infrequently deceive ourselves into thinking that an adequate explanation of their complaints has been given.

I do not wish to be understood as suggesting that all of these come within the field for discussion in this paper. Nor shall I be able to define with any exactness by what criteria they may be selected. All I desire to propose is an angle for approach not generally considered, in the hope that this may lead, through more exact knowledge, to methods of relief not usually followed.

My interest was aroused some two and a half years ago when, in the effort to puzzle out a difficult case, my attention was drawn to a publication by von Gaza in *Arch. für Klin. Chir.* 1924. Von Gaza put forward his belief that in some instances these patients may be relieved of their pain by section of the paravertebral nerves or the sympathetic rami communicantes, on the ground that afferent stimuli arising in the distribution of the sympathetic nervous system may, in abnormally irritable states, be recognized as pain referred either to the area from which the nerve has come or to the corresponding cerebrospinal segment. Such a theorem demands an inquiry into our knowledge of the possibilities for perception of pain from areas whose nerve supply is derived from the sympathetic nervous system.

In the opening chapter of his book "Die

\* Read before the Surgical Section, New York Academy of Medicine, May 1929.

Leitungsbahnen der Schmerzgefühls und die chirurgische Behandlung der Schmerzzustände," Foerster states that, "pain is to all of us a well known definite psychic experience." As a psychic experience it can be perceived only in response to afferent stimuli depending on the irritability of a sensory end organ, on a sensory path to conduct the effect to the central grey matter. Various factors influence our perception of pain. The character of the stimulus, not only its kind and intensity but its duration, the summation of effect, may play an even greater rôle in the sympathetic than in the cerebrospinal pain system. Also the varying irritability of the sense organ is of the greatest importance. We know that the acuteness of perception of pain varies greatly among individuals within normal limits, and varies in individuals at different times. We know that our perception of pain is most acute if our attention is fixed in expectation of the exciting stimulus, or dulled if our attention is otherwise engaged. I have seen a man run on the bared stumps of a shattered leg, flinging his foot, still held by his boot, to one side with each step, without the perception of pain. One hour after, in quieter surroundings, such activity would have been impossible. I have seen a two year old child sit in its cot quite pleased at the attention while a three inch incision was made in its scalp for the drainage of an abscess, when no anaesthetic, either local or general, had been used. The child had no ability to perceive pain anywhere on the surface of its body though touch, heat and cold could be recognized. Is it possible that there were no sensory nerve endings adapted for the perception of pain stimuli? Are there specialized nerve endings for the perception of pain alone? This is of some importance for our thesis and again I turn to Foerster's book. Many arguments sustain the view that there is a specialized pain-perception system, but there

is as yet no evidence to prove that any one of the very many types of sensory end organs is specialized for the perception of pain alone. Such evidence as there is points in the opposite direction.

The pain with which we are most familiar comes to us from the skin surface as the result of cutting, sticking, burning, and pinching. We know equally well that pain may arise from injuries to deeper structures, bones, joints, tendons; not quite the same quality of pain and not set up by quite the same quality of injury, though they overlap. Stretching or pressure are more potent causes than cutting. These are stimuli which the deeper structures are more accustomed to perceive.

We are now beginning to realize, especially since the use of local anaesthesia within the abdomen and within the head, that there is scarcely an organ in the body from which pain sensations cannot originate. It is held by some writers, notably Kappis, that these sensations of pain arise not in the organs themselves but in the connective tissue about the organs. Especially is this true of the vessels, so much so that some regard all pain originating within the abdomen as vessel pain. There are, however, many reasons to believe, that many if not most of the pain paths pass through the sympathetic rami communicantes. Some of these will be referred to later, in discussing the localization of pain in the abdomen by blocking the rami with novocaine. It has also been shown that sensory end-organs are present in the stomach and intestinal wall and in other of the internal organs. This would indicate that afferent impulses can come from the organs themselves. These might be interpreted as pain, especially in hypersensitive states or hypersensitive individuals. It may well be that the ordinary pain stimuli, that is ordinary for the skin surface, such as cutting or burning, might not be so perceived, but that others, such as pressure, stretching being for the internal organs the more common stimulus, may be so perceived, especially in states of unusual irritability.

The afferent paths of the sympathetic system are now moderately well known. It is generally accepted among authorities that afferent paths capable of conducting pain stimuli come from the vessels and join mixed nerves, such as the sciatic, and that the fibres are arranged in a

segmental manner associated with spinal cord segments. Foerster believes that there is evidence to support the view that there is besides this a direct continuous path in the adventitia of the vessel through the sympathetic ganglia to the cord. In support of this he quotes a very interesting instance. The three lowest cords of the cervical plexus had been severed. This left the little finger insensitive on the surface, but not in the depth. He then dissected out the nerve and stimulated the proximal end with a strong electric current; there was no pain. He then laid bare the corresponding digital artery; irritation of this caused acute pain. The lesion in the cervical plexus was peripheral to the entrance of the sympathetic. It is difficult to see how else than by a direct path up the vessels this stimulus could be recognized.

There are several possible afferent paths from the abdominal organs by which painful sensations might reach the central nervous system.

1. They might pass by the splanchnics to join the cord through the posterior roots of the spinal nerves. Such afferent paths have been demonstrated from the stomach, intestine, pancreas, spleen, liver and gall bladder, to enter the cord from the 6th dorsal to the 3rd lumbar.

2. Impulses might pass up with the vessels and reach the cord by paths as high as the 8th cervical.

3. Or, as has been more generally held, the pain paths may be through the vagus or phrenic nerves.

That the splanchnic contains sensory and indeed pain paths can be shown by stimulating the central end of the cut splanchnic, and local infiltration of the cæliac plexus, according to Leriche and Kappis, renders the whole peritoneum painless. This, of course, does not exclude the vagus as this would also be anaesthetized. Foerster states that stimulation of the central end of the cut vagus causes nausea, but not pain. After total section of the cord at the level of the 5th, 6th and 7th cervical vertebrae, sensation, but not pain, can be stimulated by irritation in the abdomen. Foerster concludes that the pain paths from the abdomen follow the afferent paths of the sympathetic through the dorsal roots.

Considerable evidence has accumulated, based on Head's work on the alterations in

sensation in visceral disease, and more recently on the studies of Kappis and Löwen, who by paravertebral injections of novocaine relieved pain associated with known disease of the intra-abdominal organs. It has been shown, with a fair degree of certainty, that the afferent path and, as we believe, the pain path, from the oesophagus enters the cord through the 5th and 6th dorsal roots; from the stomach through the 6th to 8th dorsal roots; from the liver and gall bladder through the 9th to 11th, and from the small and large bowel through the 10th dorsal to the 1st lumbar.

It was from a background such as this that von Gaza started. He elaborated the observations of Head and MacKenzie that disease of abdominal organs often makes itself manifest by disturbances of skin sensation. His method was to inject novocaine, to block the paravertebral nerves in known disease of intra-abdominal organs accompanied by pain. If relief followed this injection the presumption was that the pain paths passed through the blocked area. He comes to the conclusion, differing somewhat from Foerster, that the oesophagus corresponds to the  $D_5$  to  $D_6$  cord segment; the cardia to the  $D_6$  to  $D_7$ ; the stomach to the  $D_7$  to  $D_8$  (6 to 9?); the small bowel to the  $D_9$  to  $D_{10}$ ; the colon to the  $D_{11}$  to  $D_{12}$ ; the liver and gall bladder to the  $D_9$  to  $D_{10}$ ; the kidney to the  $D_{12}$  to  $L_1$ ; the pelvic organs to the  $D_{12}$  to  $L_1$ . He was able in thirty instances, in patients with well marked Head zones, to produce an anaesthesia of the Head's zone and at the same time a relief of the pain.

He came to the following conclusions in regard to the indications for sympathectomy.

1. An organic lesion must be definitely shown not to be present. This will mean as a rule exploration of the abdomen. It has usually already been done.
2. The site of the lesion must be established by a constant Head's zone of hyperesthesia, together with the supporting evidence of the paravertebral novocaine injections.
3. The paravertebral injections must relieve the pain for at least an hour or two.
4. The paravertebral injections must always precede the operation, must be successful and must be repeated.
5. The resection of the paravertebral nerves may extend over at most two segments.

At this time von Gaza reported three successful cases. I know of no others except the two to be detailed to-night. In the first he resected the 10th paravertebral nerve; in the second he cut the rami communicantes  $D_9$  to  $D_{12}$ ; in the

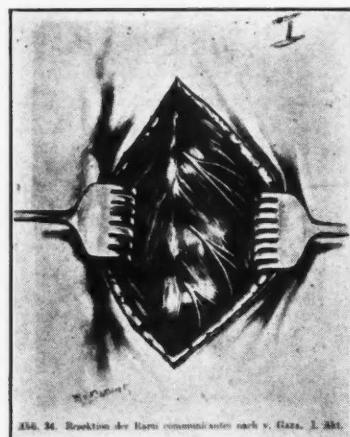


Abb. 34. Resektion der Rami communicantes nach v. Gaza. I. Akt.

FIG. 1

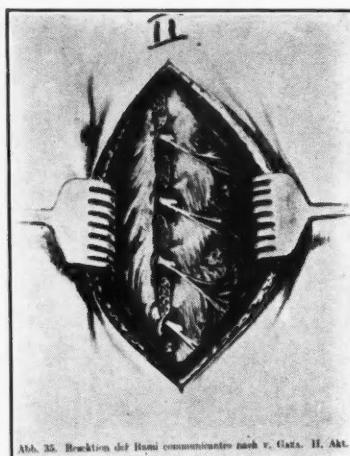


Abb. 35. Resektion der Rami communicantes nach v. Gaza. II. Akt.

FIG. 2

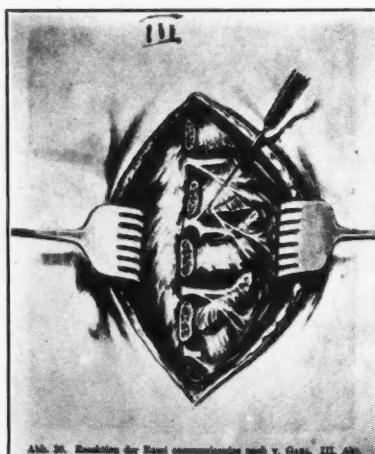


Abb. 36. Resektion der Rami communicantes nach v. Gaza. III. Akt.

FIG. 3

Steps in the operation as described by von Gaza. Illustrations taken from his original paper.

third he cut the rami communicantes  $D_3$  to  $D_6$ .

The steps of the operation are theoretically simple and actually not difficult, at least in the areas usually required for intra-abdominal pain,  $D_6$  to  $L_1$ . My illustrations are taken from von Gaza's paper.

The incision is made in the back, about 3 cm. to the right or left of the dorsal vertebral spines, and must be long enough to give a good exposure of the transverse processes of the vertebrae. The muscles are separated off the vertebrae and held to the side until the transverse processes are seen. During this process the superficial branches of the nerves are preserved and act as guides. The muscles and tendinous attachments of the transverse processes are cut away by sharp dissection or by sharp raspatory. To display the paravertebral foramen, the transverse process must be removed. This is done by chiselling close to the body of the vertebra. During the removal of the transverse process care must be taken not to wound the pleura which lies close under the process. Into this space filled with fatty tissue the superficial branch of the paravertebral nerve disappears. The intercostal muscles are then cut outwards from three-quarters to one inch and the deep branch of the paravertebral nerve sought for. The fat is picked away and as the nerve is lifted on blunt hooks, if the dissection has been carefully done, the two fine nervi communicantes, white or grey, are seen passing almost vertically forwards towards the abdomen. They are about the thickness of sewing thread and join the paravertebral nerve

quite an appreciable distance from the union of the two roots. The root ganglion is not seen. There is no other nerve structure taking this course.

The two case reports I have to present which justify this review are as follows.

#### CASE 1

M. F., a female, aged 34, admitted in April, 1926, with a provisional diagnosis of neuralgia in the left side of the abdomen, from which she had been incapacitated for three years and bed-ridden for eighteen months. She had had a long and complicated history, covering many admissions to the hospital, through all of which runs the complaint of left-sided abdominal pain.

Her first admission was in 1895, when, at the age of three, there was diagnosed a tuberculous arthritis of the left knee. During the next fifteen years she was in the hospital ten times for this, and finally in 1911 a resection of the knee was carried out. It was about this time that the left-sided pain became prominent and various diagnoses were made; left-sided pleurisy with no objective signs; tuberculosis of the spine with no x-ray confirmation.

In February, 1912, the appendix was removed. In March, 1915, a fibroadenoma was removed from left mammary gland. In October, 1915, neurasthenia was diagnosed.

In October, 1916, early tuberculosis of the spine was suspected but no lesion demonstrated. In October, 1920, she was admitted to the urological department for pain in left side; no disease was found. In September, 1923, a left ovarian cyst and Fallopian tube were removed. In September, 1925, tonsillectomy was performed. In October, 1925, laparotomy; examination of the pelvis and abdomen revealed nothing pathological. Suspension of the uterus was done.

On April, 1926, she was again admitted to the urological department on account of left-sided abdominal pain. She had been in bed for a year and a half. The whole left side of the abdomen was pigmented brown from long and repeated hot applications. The urinary tract was found normal. She was then transferred to the general surgical service.

She was thin, irritable, and greatly depressed, screaming from time to time with pain, very impatient and difficult to manage, asking for morphine constantly.

Her examination revealed nothing except an area of hyperesthesia in the left abdominal wall corresponding to the distribution of the tenth and eleventh dorsal nerves, and terminating at the mid line.

On May 7, 1926, a novocaine injection was made well distal to the entrance of the sympathetic. This resulted in a loss of sensation over the area which had been anaesthetized, but with no relief of the pain.

On May 9, 1926, a paravertebral injection was done with anaesthesia and there was relief of pain for one and a half hours.

May 25, 1926, a resection of the rami communicantes of the 10th, 11th, 12th dorsal and 1st lumbar was carried out. For the next ten days she was worse in every way. Her back was painful, her complaints were bitter, the operation had made her worse and she desired to die; but at the end of that period when the soreness of the wound subsided she began to realize that the "old pain was gone." In three weeks she was about the ward, a most grateful patient. She has continued her work ever since not entirely free from all pain. She has been in the hospital twice since, once for frequency of urination for which no cause was found, and once for the removal of the uterus not she tells me for the "old pain which has not recurred" but perhaps from force of habit.

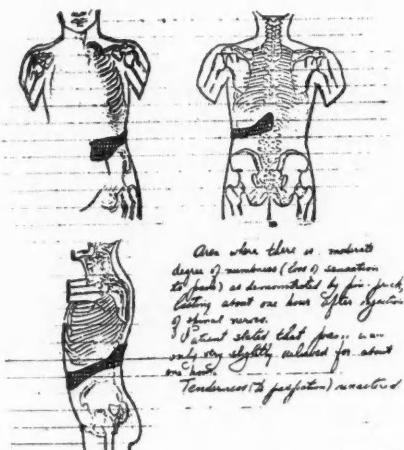


FIG. 4.—Head zones as found in Case 1.

## CASE 2

Mrs. D. S. (No. 63853), admitted November, 1927.

First hospital admission for pain in the right side of the abdomen, 1919, when the appendix and right ovary were removed.

She was re-admitted for pain in the right side of abdomen supposed to be due to diseased kidney. The right kidney was exposed and sutured up in place. The pain continued.

Re-admitted, complaining of pain in the distribution of the 10th and 11th nerves. A colopexy was done but without relief of pain, and later a resection of the 10th and 11th nerves in the loin was done. Her pain continued.

In June, 1927, a paravertebral block of the 9th to 12th segments under novocaine caused the pain to disappear for two hours.

She returned in November of 1927 still complaining of pain in the right side. On examination the area supplied by the 10th and 11th nerves was anaesthetic. The pain was so severe as to frequently cause her to be confined to bed for periods of two to three weeks. She then had relative relief, though she was never free from pain.

On November 25, 1927, rami-section of the 9th to 12th dorsal segments was carried out according to the von Gaza operation. She had immediate relief of pain which remained entirely absent until March of 1928 when there was a recurrence for four days. She then had relief till September, 1928, when there was again some return of pain but not sufficient to keep her from work.

In January, 1929, she reported that she was free from pain most of the time, but had occasional returns of less degree but never sufficient to prevent her doing her work.

## SUMMARY

There is convincing evidence that afferent impulses are conveyed through the sympathetic nervous system and reach the consciousness to be perceived as pain. This is especially clear in regard to the sympathetic paths in the adventitia of vessels, and it is probably true that such distribution is segmental and may reach the cord either by nerves joining the mixed nerve trunks at intervals from the vessels, or that there are direct paths following the vessels to the sympathetic ganglia and so relayed to the cord. This seems to explain the erratic results which follow a periarterial sympathectomy. This procedure, though unpopular at the moment, offers evidence which is hard otherwise to explain and which the careless pronouncement of "psychic" does not explain.

There is every day experience of pain referred to and arising in the organs contained within the abdomen. For this there are several possible routes; the periarterial paths; the vagus and phrenic nerves; and the more direct sympathetic path through the posterior root to the cord. There is clinical and experimental evidence to suggest that the main paths by

which pain is perceived pass through the posterior root, and that the different abdominal organs are associated in this way with vertebral segments.

It has been shown that sensory end organs are present in most of the abdominal viscera, and that these are comparable with the sensory pain receptors in the peripheral systems.

There has further been demonstrated an anatomical mechanism by which such afferent impulses may enter the posterior root from the sympathetic ganglia and synapsise around cells of the posterior horn.

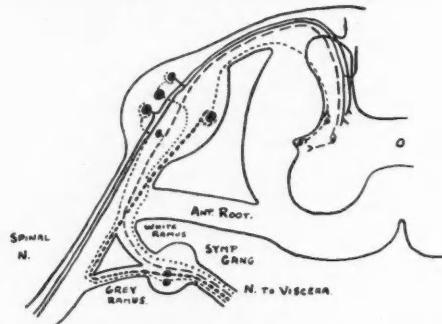


FIG. 5.—Afferent sympathetic paths. Diagram by Prof. Beattie.

The afferent sympathetic fibres enter the spinal nerve by two routes; the white and the grey rami. The fibres entering by the white ramus have the cell body in the posterior root ganglion. The fibres from these cells take either one of two ways of termination: (a) by entering the spinal cord directly through the posterior root and probably terminating around cells in the cord which, in their turn, are connected with cells from which arise the preganglionic nerve fibre; (b) the cell body gives off a short fibre which ends by breaking up into a pericellular network around the cell body of a neurone in the posterior root ganglion. The neurone around which such a fibre terminates is a somatic and not a sympathetic neurone.

The fibre entering by the grey ramus is believed to have a cell station in the sympathetic ganglion itself. The central process of this cell terminates in one of two ways: (a) by forming a pericellular network around small cells in the posterior root ganglion, which send processes into the spinal cord where they probably terminate around cells in the posterior

horn; these small cells have no peripheral fibres; they are unipolar cells.

(b) The fibre in the grey ramus passes into the posterior root ganglion and terminates around the cell body of a sensory neurone.

These are all the methods of termination of sensory sympathetic neurones which have been described. It is probable that by far the greatest number of sympathetic afferent fibres are analogous with somatic afferent neurones, that is, they have a cell body in the posterior root ganglion, a peripheral fibre lying in the white ramus, and a central fibre in the posterior root which enters the spinal cord and ends around a posterior horn cell. A smaller number have the cell body in the sympathetic ganglion and a central fibre which terminates in the cell in the root ganglion and so leads impulses to the cord. Others synapsise around

the cell in the root of the somatic sensory path, and so project the sensation of pain to the corresponding cerebrospinal distribution, thus producing the Head's zone of hyperesthesia. We have then a mechanism reasonably assured which makes anatomically probable our clinical and experimental observations.

Given a constant source of irritation in an individual of excessive sympathetic irritability, is it not possible that we should be able to relieve pain by severing the corresponding paths of entrance to the cord, in cases when that pain arises from organs showing no gross disease, or where such disease is not locally remediable?

I am indebted to Dr. John Beattie for his assistance in the demonstration of the anatomical pain paths and for the illustration showing these possible paths.

#### THE RADIOLOGICAL EXAMINATION OF THE HEART AND GREAT VESSELS\*

BY DIGBY WHEELER, M.A., M.D., C.M., M.R.C.S., L.R.C.P.,

*Associate Radiologist, Winnipeg General Hospital; Formerly Lecturer in Anatomy,  
University of Manitoba,*

*Winnipeg*

"THE inspection and the palpation of the movements of the heart and the percussion of the heart's dullness give a far more valuable indication of the size of the different chambers of the heart than an x-ray examination. Indeed I am doubtful if any x-ray examination of the heart has ever thrown the slightest light upon any cardiac condition." This sweeping and unqualified condemnation was made by Sir James MacKenzie. It is quoted from the "Oxford System of Medicine," of which he was chief editor. One pauses before attempting to refute the opinion of so eminent a cardiologist, especially when his view is upheld by many prominent internists. Yet very few physicians seem aware of the information, both confirmatory and supplementary, which may be derived from an x-ray examination of the heart. Recent text-books

and literature on the heart almost completely ignore radiological findings.

Twenty-five years of progress in cardiac radiology have proved that the x-ray may give information of definite clinical value which cannot be determined in any other way. Moritz, of Germany, and Vaquez and Bordet,<sup>1</sup> of France, were the pioneers. The results of work in this field on this continent are presented in the monograph of Van Zwaluwenburg and Warren,<sup>2</sup> the articles of Hodges and Eyster,<sup>3</sup> Karshner and Kennicott,<sup>4</sup> Wilson and Merrill,<sup>5</sup> Levi,<sup>6</sup> Langley,<sup>7</sup> and Pendergrass.<sup>8</sup>

Van Zwaluwenburg,<sup>9</sup> in a letter to his friend, Dr. A. W. Crane, expressed what many radiologists feel: "I think my irritation is altogether in consequence of the failure of the medical profession to recognize the value of this method of cardiac examination. Undoubtedly men have not wished to take the time to learn the trick or to do the work when other more immediately profitable work was at hand. Be-

\* From the Radiological Department, Winnipeg General Hospital. Read before the Winnipeg Medical Society, November, 1928.

sides, few roentgenologists have the necessary preparation in medicine to interpret their findings when they get them. Men who have come to our clinic from elsewhere ultimately come to the conclusion that the method adds more value than any other laboratory method to the examination of cardiovascular conditions."

Certain of the familiar signs of cardiac disease can be detected by clinical examination only, others can be demonstrated by both clinical and x-ray methods, and still others can be shown by x-ray only. The limitations of each method are clearly set forth by Crane.<sup>10</sup> It is obvious that the x-ray can be of no assistance in demonstrating many of the familiar signs. Clinical examination must remain the important procedure. Clinical examination must still discover the presence of murmurs, clicks, bruits, palpable thrills, irregularities of the heart beat, fluid in the pericardial sac, the reaction of the cardiac muscle to forced exercise, the character of the respiration, the colour of the skin, the size of the liver, and oedema of the extremities. "Heart tones and murmurs can be studied only by the ear; a thrill can be detected only by the sense of touch; dyspnoea and pain can be realized only by the patient; blood pressure, electrocardiograms and other tracings can be obtained only by special instruments; and clinical observation must evaluate the character of the respiration, oedema of the extremities and cyanosis."<sup>10</sup>

*The x-ray offers confirmatory evidence in the study of the alteration in the size of one or more chambers of the heart, the position of the heart within the chest, the movements of the heart, fluid or gas in the pericardial sac, and calcification, aneurysm or dilatation of the thoracic aorta.* Congestion of the lungs from cardiac decompensation, pulmonary and mediastinal tumours, because of the difficulties of differential diagnosis, may require the assistance of the x-ray.

*The x-ray is the only procedure which can accurately demonstrate the form and size of the heart, the enlargement and pulsation of each chamber separately, calcifications of the pericardium or thoracic aorta, small aneurysms and dilatations of the thoracic aorta.* "It is not too much to say that clinical estimation of heart size is grossly inaccurate by comparison."<sup>10</sup>

It is therefore seen that the radiological ex-

amination should be supplementary to the clinical. Additional information may be obtained and while some of the findings will be of purely academic interest many others will have a definite clinical value.

#### ANATOMICAL CONSIDERATIONS

The chambers of the heart and the extent to which they contribute to the silhouette in the antero-posterior position are well known. The extent to which they contribute to the silhouette in the oblique and lateral positions is not so well known. A search was made in the various recognized text-books of anatomy and no photographs were found of the heart in oblique or lateral positions.

A normal heart hardened *in situ* was removed from the thorax and placed in the correct anatomical position, then photographed from different angles. The results are shown in Figs. 1, 2, 3, and 4.

From a study of these photographs it is apparent which chambers are responsible for the silhouette in any particular position.

Fig. 1.—The posterior border is formed by the right innominate vein, the superior vena cava, the right atrium, and the inferior vena cava; the anterior border, by the ascending aorta, to a slight extent by the stem of the pulmonary artery, and the right ventricle.

Fig. 2.—The right border is formed by the right innominate vein, superior vena cava and the right atrium; the left border, by the highest portion of the arch of the aorta, the stem of the pulmonary artery, the left auricle just peeping around the conus arteriosus, the right ventricle and, at the left inferior angle, the left ventricle; the inferior border, by the right atrium and the right ventricle.

Fig. 3.—The right border is formed by the right innominate vein, the superior vena cava, the ascending aorta, the right atrium, and the inferior vena cava; the left border, by the distal half of the arch of the aorta, the beginning of the descending aorta, the pulmonary artery, the left atrium and the left ventricle; the inferior border, by the right atrium, the right ventricle and the left ventricle.

Fig. 4.—The right border is formed by the superior vena cava, the proximal portion of the arch and ascending aorta, the right auricle overlapping the conus arteriosus, and the right ventricle; the left border, by the distal portion



FIG. 1.—Normal heart in the anatomical position—right lateral.



FIG. 3.—Normal heart in the anatomical position—antero-posterior.



FIG. 2.—Normal heart in the anatomical position—right anterior oblique.



FIG. 4.—Normal heart in the anatomical position—left anterior oblique.



FIG. 5.—Normal heart in the anatomical position—right lateral. Chambers injected.



FIG. 7.—Normal heart in the anatomical position—antero-posterior. Chambers injected.



FIG. 6.—Normal heart in the anatomical position—right anterior oblique. Chambers injected.



FIG. 8.—Normal heart in the anatomical position—left anterior oblique. Chambers injected.

of the arch and the thoracic aorta; the inferior border, by the right ventricle and the left ventricle.

It was thought that information of value would be obtained if the chambers of a normal heart were injected separately with an opaque solution and then radiographed. The extent to which each chamber contributes to the cardiac shadow in each plane is easily seen in Figs. 5, 6, 7, and 8.

The technique of these injections is quite simple. Water was added to barium sulphate and flour until the mixture would flow easily from a 100 c.c. syringe. For the injection of the right atrium the cusps of the tricuspid valve were firmly sewn together, it being desired to inject only one chamber at a time. A similar procedure was followed for the injection of the other chambers of the heart.

A study of these injections would lead one to think that the capacity of the right ventricle is considerably greater than that of the left. In a normal heart this, of course, cannot be true, because the output of both ventricles must remain equal, otherwise there would be a piling up in one or other circulatory system. Fig. 8 throws some light on this difficulty, inasmuch as it shows that the right ventricle has a wide cavity but a very narrow diameter antero-posteriorly. It simply embraces the thick-walled left ventricle.

Figs. 9 to 11 represent an analysis of the cardiac silhouette, and the variations which may occur in this silhouette due to the enlargement of the chambers of the heart or great vessels.

The normal anatomical outline is represented by the heavy lines. The alteration of the silhouette which may occur, due to enlargement or dilatations of any chamber or great vessel, is suggested by the dotted lines.

Fig. 9 shows the position of the posterior cardiac sulus. Obliteration of the sulus in the upper third suggests some enlargement of the ascending aorta; in the middle third, some enlargement of the left atrium; and in the lower third, some enlargement of the right atrium. It is in this position that the most accurate estimation of the width of the aorta can be made. The enlargement of the right ventricle anteriorly is, of course, restricted by the thoracic wall.

Fig. 10 suggests that alteration in the right border does not necessarily mean an enlarged

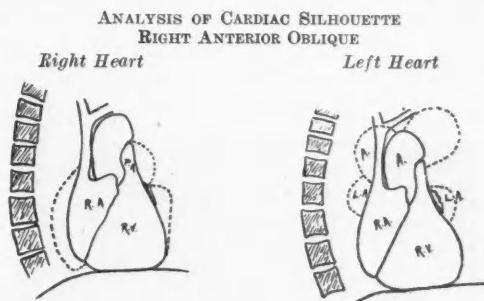


FIG. 9

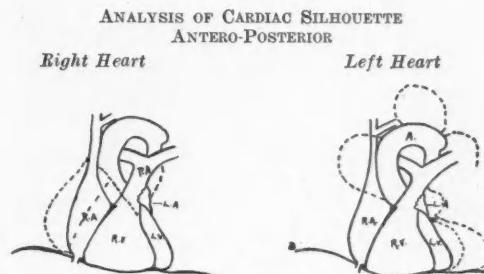


FIG. 10

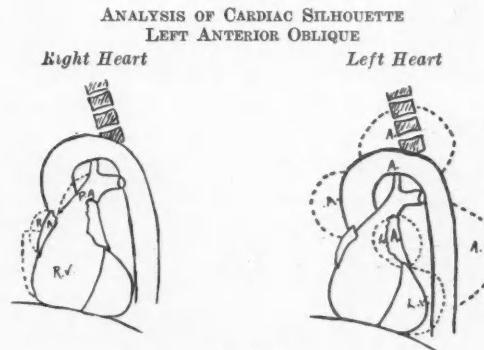


FIG. 11

atrium, but is due to the right atrium and the coronary sulcus being pushed to the right by an enlarged right ventricle. Two types of left ventricular enlargement or hypertrophy are suggested, the inner dotted line being the snub-nosed heart of essential hypertension, the outer dotted line the "cor bovinum" of aortic incompetence.

Fig. 11 gives a complete view of the arch and descending aorta. The transverse sinus appears as a clear space beneath the arch.

#### PATHOLOGICAL CONSIDERATIONS

Figs. 12 to 15 illustrate the assistance that radiological examination may give in the diagnosis of heart disease.

Fig. 12.—The right anterior oblique view shows obliteration of the posterior cardiac sulcus in the upper third and marked increase in the width of the aorta.

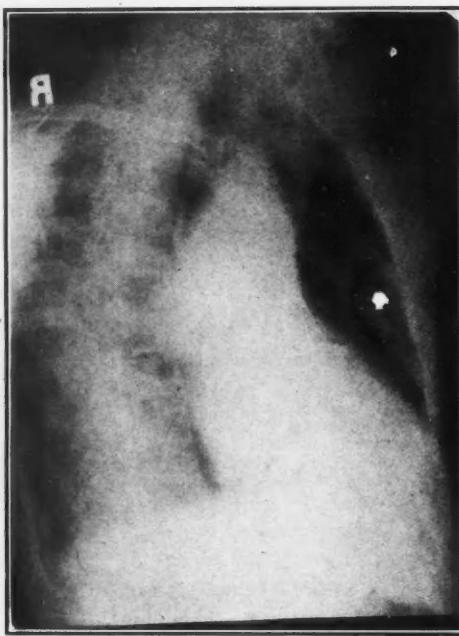


FIG. 12.—Increased width of the aorta—right anterior oblique position.

Fig. 13.—This antero-posterior view (same patient as in Fig. 12) shows marked left ventricular hypertrophy, marked increase in the width of the ascending aorta, and an aneurysmal dilatation extending to the right from the ascending aorta.

Fig. 14.—Right anterior oblique position shows a prominent pulmonary artery. This patient had a congenital heart lesion and because of the enlargement of the pulmonary

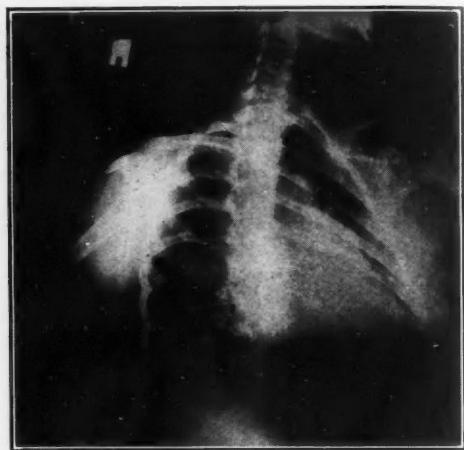


FIG. 13.—Left ventricular enlargement; increase in width of ascending aorta; aneurysm of ascending aorta. Antero-posterior view of same patient as in Fig. 12.

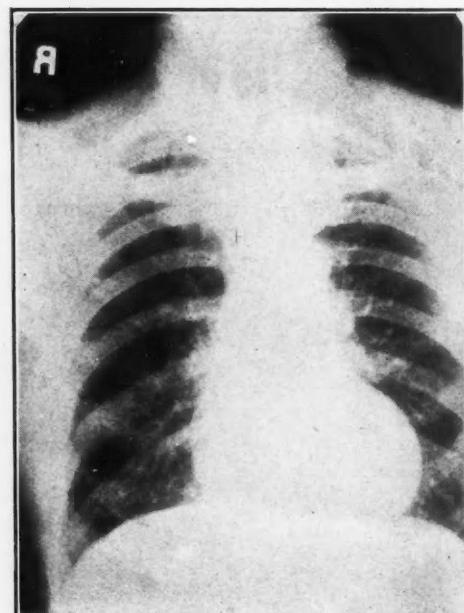


FIG. 14.—Enlarged pulmonary artery, patent ductus arteriosus—right anterior oblique position.

FIG. 15.—Left ventricular hypertrophy, essential hypertension—antero-posterior position.

artery the possibility of a patent ductus arteriosus was suggested. This was later confirmed at post-mortem.

Fig. 15 illustrates left ventricular hypertrophy due to hypertension. The left ventricle presents a snub-nosed appearance.

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## DIFFERENTIATION OF PLASMA CELLS FROM MAST CELLS IN THE INTESTINAL MUCOSA OF THE WHITE RAT\*

BY E. N. BALLANTYNE, M.D.,

*From the Department of Anatomy, University of Western Ontario,  
London, Ont.*

CERTAIN cells in the mucosa of the white rat's jejunum contain cytoplasmic granules which may be stained metachromatically with stains of the thionin group. These cells are found between the glands, within the villi, and also to some extent in the submucosa. They have been described as "mast" cells by Maximow,<sup>1</sup> Sansonow,<sup>2</sup> and Weill.<sup>3</sup> It is the purpose of this paper to show that they are really plasma cells.

#### TECHNIQUE

Tissues were fixed by immersion for at least a week in 20 per cent formal, saturated with magnesium carbonate and containing 0.75 per cent sodium chloride. They were then washed for only a few minutes in distilled water, after which frozen sections were cut, 15 microns in thickness. For differentiating plasma cells from mast cells I have used Ehrlich's specific mast cell stain and Unna's differential orcein method. To stain the granules in both plasma cells and mast cells at the same time I have used aqueous solutions of thionin, toluidine blue, and polychrome methylene blue. Cut sections were stored for periods of varying duration in distilled water, 0.75 per cent sodium

chloride solution; saturated solution of magnesium carbonate; 0.75 per cent sodium chloride solution saturated with magnesium carbonate; and various other solutions. The influence upon the subsequent staining of plasma cell granules and of mast cell granules was noted. Distilled water, ether water (1 drop of ether to 5 c.c. of distilled water), or saturated solution of magnesium carbonate, with or without 0.75 per cent sodium chloride, were used for differentiation. Sections were mounted in 50 per cent aqueous glycerine, euparal, or balsam. Dehydration was accomplished by dropping alcohol upon the section spread out on the slide ready for mounting. Metachromatic colour shades are best detected in these comparatively thick frozen sections with a mild artificial light and without the use of a blue glass. I used an ordinary 40-Watt interior frosted nitrogen bulb.

#### RESULTS

I have been unable to find any mast cells in the mucosa or submucosa of the rat's jejunum, either by Ehrlich's specific method or by Unna's method for differentiating mast cells and plasma cells, although in almost all cases I have been able to find from two or three to a dozen in the stump of the mesentery. Since I have been able to find mast cells in considerable numbers in the submucosa of the rat's large

\* Presented before the forty-fifth session of the American Association of Anatomists at Rochester, N.Y., March 27, 1929. See abstract in *The Anatomical Record* **42**: 4, March 25, 1929.

intestine, one might expect to find them also in the submucosa of the jejunum, but I have been unable to find a single example in my sections. The inability to find any cells in the mucosa or submucosa of the rat's jejunum which stain as mast cells by Ehrlich's or by Unna's method appears to justify the conclusion that no mast cells (of Ehrlich) are present in this location, or, at least, if present they are very rare.

Since no mast cells (of Ehrlich) are present in the mucosa of the rat's jejunum I believe that the cells formerly described as mast cells

in this location are really plasma cells, for the following reasons. (1) Unna's differential staining method reveals the presence of numerous plasma cells in the mucosa and submucosa. These plasma cells correspond to the so-called mast cells in distribution, size, and shape, and in the position of the nucleus and the proportion of nucleus to cytoplasm. The nucleus is usually eccentric. The cytoplasmic area is usually much greater than that of the nucleus. The shape varies from oval to polyhedral. The size varies considerably, but in general the plasma cells are the largest and most con-

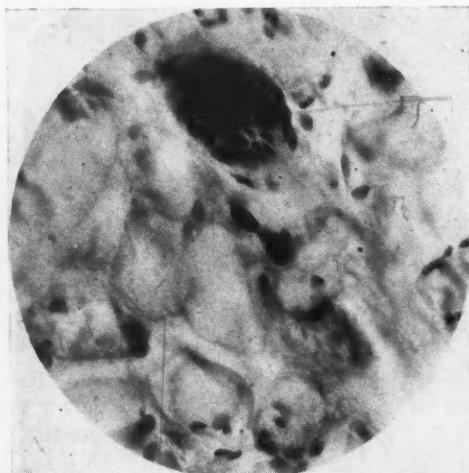


FIG. 1.—Mast cells in the mesentery of a white rat; Ehrlich's specific mast cell stain. X320.

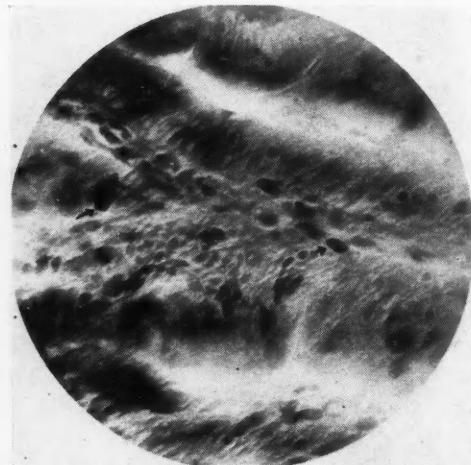


FIG. 3.—Villus, white rat's jejunum; non-specific thionin stain. Note the dense granular plasma cells in the intravillus tissue. X320.

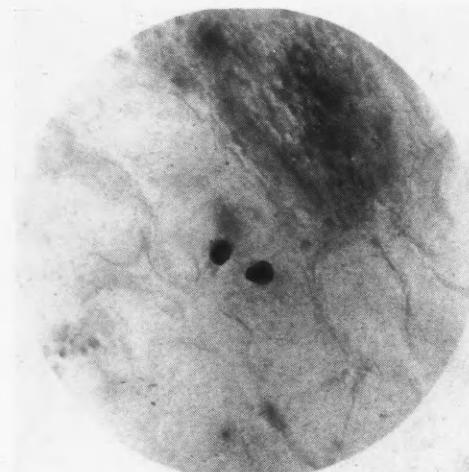


FIG. 2.—Mast cells in the mesentery of a white rat; non-specific thionin stain. X320.

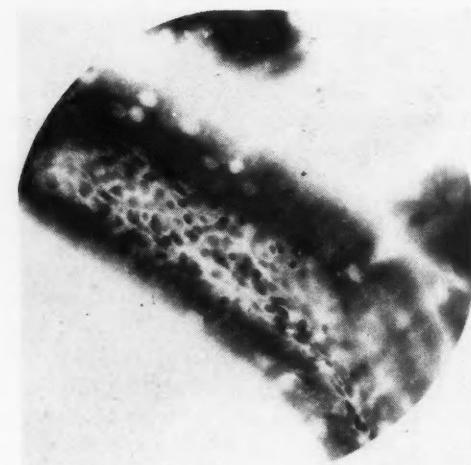


FIG. 4.—Villus, rat's jejunum; Unna's differential stain for mast cells and plasma cells. Note the absence of mast cells and presence of numerous plasma cells. X320.

spicuous cellular elements present within the villi and between the glands. They are the only cells which do correspond to the so-called mast cells in all these particulars. (2) With thionin, toluidine blue, and polychrome methylene blue all grades of transition may be seen at times, from plasma cells with diffusely staining cytoplasm, either metachromatic or non-metachromatic, to cells showing granules with varying degrees of distinctness. Indeed, in some cases cells have been seen showing diffusely staining cytoplasm in one pole and metachromatic granules in the other. As the number of cells showing metachromatic granules increases with improvements in the technique, the number of diffusely staining basophilic cells decreases. In some cases I have been able to show granules in nearly all the cells of a given section which looked at all

like plasma cells. However, not all the plasma cells show basophilic metachromatic granules and the proportion has varied even with the best technique. The probable explanation for this will appear in the discussion. (3) The nuclear detail is usually not visible in plasma cells stained to show metachromatic granules, but in some preparations it has been well shown, particularly with toluidine blue staining and glycerine mounting. In these cases the chromatin has always had the distribution characteristic of a plasma cell nucleus, the so-called "cart-wheel" or "checker-board" nu-

cleus. While this is not of itself diagnostic of a plasma cell, taken along with other morphological features it contributes to the diagnosis. One such morphological feature which we have noted is the presence in these plasma cells with metachromatic granules of vacuoles or clear areas such as are described as typical of plasma cells. I have also noted in some cases the perinuclear clear area referred to frequently in descriptions of plasma cells. (4) Sketches to show the position of cells with metachromatic granules were made after toluidine blue staining. The sections were then destained with alcohol and restained with haematoxylin. The result was that the cells which previously showed metachromatic granules now showed a diffusely staining basophilic cytoplasm, and otherwise presented an appearance typical of plasma cells. I feel, therefore, that the evidence here submitted is sufficient to warrant the conclusion that these metachromatic granular cells in the mucosa of the rat's jejunum are really plasma cells.



FIG. 5.—Interglandular region rat's jejunum; non-specific toluidine blue stain, showing cytoplasmic granules and nuclear detail in a plasma cell. X720.

like plasma cells. However, not all the plasma cells show basophilic metachromatic granules and the proportion has varied even with the best technique. The probable explanation for this will appear in the discussion. (3) The nuclear detail is usually not visible in plasma cells stained to show metachromatic granules, but in some preparations it has been well shown, particularly with toluidine blue staining and glycerine mounting. In these cases the chromatin has always had the distribution characteristic of a plasma cell nucleus, the so-called "cart-wheel" or "checker-board" nu-



FIG. 6.—Enlargement of the plasma cell shown in Fig. 5. Note cytoplasmic granules and nuclear detail. X2160.

The authors<sup>1, 2, 3</sup> who have described these cells in the mucosa of the rat's jejunum as mast cells have noted certain differences between them and typical tissue mast cells. The granules are finer, more variable in size, and do not fill the cytoplasm of the cell so completely. Maximow<sup>1</sup> says that during fixation and staining the tissue must not come in contact with water or aqueous solutions or the granules will be dissolved more or less. I find that although the granules of the plasma cells are lost to some extent in distilled water or hypotonic sodium chloride solution, either be-

fore or after fixation, they are comparatively well preserved in 0.75 per cent sodium chloride solution, especially after fixation. Mast cell granules, on the other hand, are unaffected by immersion for several days in distilled water after fixation.

I find, also, that slight alkalinity is essential for the staining of plasma cell granules by the methods which I have employed, with the exception possibly of a very occasional cell. Even exposure of one hour to the very slight acidity of distilled water is sufficient to prevent their staining. This is shown by the fact that the ability of the granules to take the stain may be restored by about fifteen minutes immersion in a weakly alkaline solution (saturated solution of magnesium or lithium carbonate, or 0.25 per cent potassium carbonate or sodium bicarbonate), except in the case of cells whose granules have been already permanently damaged. On the other hand mast cell granules are stained well after eighteen hours in a strongly acid solution. (Ehrlich's stain contains about 7 per cent acetic acid. Indeed the specificity of Ehrlich's stain seems to be due to the acetic acid which it contains, since I have been able to substitute thionin, toluidine blue or polychrome methylene blue for the dahlia in Ehrlich's formula without loss of specificity so far as the differentiation of mast cells and plasma cells is concerned). While exposure of about fifteen minutes to a weakly alkaline solution is essential to the staining of plasma cell granules, an exposure of eighteen hours or more usually damages the granules to a certain degree. The granules of the mast cells on the other hand are comparatively resistant to this treatment. On the whole, I have found that the most convenient storing fluid for the preservation of plasma cell granules in cut sections is 0.75 per cent sodium chloride solution saturated with magnesium carbonate. In the presence of the sodium chloride the granules are protected from the destructive action of the alkali, and it is only necessary to immerse the sections for 45 seconds in a saturated solution of magnesium carbonate to rid them of sodium chloride previous to staining. I have noted certain differences, also, in the reaction of mast cell granules and plasma cell granules towards mounting in different mounting media. Aqueous glycerine (50 per cent) gives a red or reddish purple colour to the granules of both mast and plasma

cells, and is a particularly favourable medium for showing detail of the granules and the nucleus. Often by this method the nucleus is well stained, particularly in the plasma cells and with toluidine blue staining. Unfortunately the stain fades, especially on exposure to strong artificial light and apparently more on exposure to certain light filters. Euparal preserves a metachromatic colour in the mast cell granules and usually in the plasma cell granules, although in the latter it may be lost to some extent, particularly after toluidine blue staining. The stain fades also in euparal, but not so readily as in glycerine. The metachromasia is retained in the mast cell granules after mounting in balsam, but is usually lost or only faintly retained in the plasma cell granules. The metachromasia is somewhat better retained in the plasma cell granules, mounted in balsam, when oil of bergamot is used instead of xylol, but even then the results are usually disappointing.

The above constitute important morphological and physico-chemical differences between mast cells and plasma cells which may well be associated with important differences in function.

#### DISCUSSION

It is significant that although Maximow<sup>1</sup> noted plasma cells in the mucosa of the rat's intestine, he did not find them in large numbers, presumably because he was staining most of them as metachromatic granular cells and calling them mast cells. He also noted that the number of these metachromatic granular cells to be seen varied with the perfection of the technique. He expressed some doubt as to the proper classification of these cells. He says, "Es sind also scheinbar keine gewöhnlichen histogenen Mastzellen. Andererseits sehen sie auch den weiter unten beschriebenen hämatogenen Mastzellen der Ratte nicht ähnlich. Es wird also wohl eine besondere Mastzellenart von unbekannter Herkunft und Natur sein."

In addition to what he calls mast cells in the rat's intestinal mucosa Weill<sup>3</sup> has described cells with eosinophilic granules and a round or oval wheel nucleus. These cells he termed myelocytes. He makes no reference to plasma cells in this location in the rat although he does describe them in other species in the same article. These may have been plasma cells with eosinophile granules and may correspond to

part or all of the residue of the plasma cells in which I was unable to demonstrate metachromatic granules in my preparations.

Mast cells (of Ehrlich) should always be differentiated from plasma cells by specific methods. Failure to do so has left in doubt the identity of certain cells which have been described as mast cells in a considerable part of the literature on the subject. For example, mast cells have been described, following the use of non-specific methods, in the intestinal mucosa of other species, as the white mouse, dog, cat, (Maximow<sup>1</sup>) and guinea pig (Weill<sup>2</sup>). A portion of the cells described as mast cells in the subcutaneous tissues of the white mouse (Broderson<sup>4</sup>) and in the bone marrow of the white rat (Maximow<sup>5</sup>) may be plasma cells. That this necessity for specific differentiation applies to other species than the rat is indicated by the fact that Krompecker<sup>6\*</sup> and Michels and Globus<sup>7</sup> have found a similar type of granular plasma cells<sup>2</sup> in human material.

#### SUMMARY

1. I have been unable to find any mast cells (of Ehrlich) in the mucosa or submucosa of the white rat's jejunum.

\* Although Krompecker says decidedly that these cells are true plasma cells, he calls them plasma mast cells. I think this is an unfortunate designation, because it combines two terms which should be kept separate and distinct, since they each separately refer to cells which should be carefully distinguished one from the other. This applies even although it should be shown at some later date that mast cells and granular plasma cells are very closely related types.

2. Cells formerly described as mast cells in this location are really plasma cells with basophilic metachromatic granules.

3. Mast cell granules stain metachromatically in a strongly acid solution, while plasma cells do not. Plasma cell granules require exposure to a weakly alkaline solution before they will stain metachromatically in aqueous solutions of stains of the thionin group. Mast cell granules do not require such treatment.

4. After fixation, plasma cell granules are well preserved in a 0.75 per cent sodium chloride solution saturated with magnesium carbonate, but not in distilled water, or a solution of magnesium carbonate. After fixation mast cells are well preserved in any of these solutions.

5. Considerable confusion exists in the literature on mast cells through failure to differentiate plasma cells from mast cells by specific methods.

I wish to thank Dr. C. C. Macklin for his kindly advice and encouragement.

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THANKSGIVING TO GOD FOR WITHDRAWING AND CEASING THE PLAGUE, 1563.—Wee yield the hartie thankes, O most mercifull father, that it hath pleased the in thy wrayth to remember thy mercie, and partlie to mittigate thy severe rodde of this terrible plague, wherwith thowe hast hitherto most justly scourged vs for our wickednes, and moste mercifully revoked vs from the same. Calline vs (who in healthe and prosperitie had cleane forgotten bothe the and ourselves) by sicknesse and adversitie to the remembrance bothe of thy iustice and iudgments and of our owne miserable fraylenes and mortalytie: and nowe leaste wee by the heaviness of thyne indignation, shulde have utterly despeyred, comfortinge vs aigayne by the manifeste declaration of thy fatherly inelynation to all compassion and clemencie. Wee beseche the to perfecte the works of thy mercie gratiuously begone in vs: and forasmuche as trewe healthe is, to be sownde and troow in that parte, which in vs is moste excellent, and

like to thy godheade; we praye the throughly to eure and heale the woundes and diseases of our sowles, grevously wounded and poysoned, by the deyl assaultes and infections of ye olde serpente Saitan, with the deadly plages of synne and wickednes: By the which inwarde infection of our myndes these outwarde diseases of our bodyes have by ye order of thy justice, O Lord, issued and followed, that wee by thy fatherly goodnes and benefyt, obteyninge perfeete health bothe of our myndes and bodies, maye render unto the therefore contynewall and moste hartie thankes, and that, by flyenge from sinne, wee maye avoyde thyne anger and plages, and ever hereafter, in innocencie and godlynesse of lyffe studieng to serve and please the, maye bothe by our wordes and works allwayes glorifye thy holly name. Which wee beseche the to graunt vs, O father of mercies and goode of all consolation, for thy deare sonne, our only saviour and mediator, Jesus Christs sake. Amen.—*Lancet*, 1929.

## TERATOMA OF THE NECK

By HOWARD SPOHN, M.B.,

*Vancouver*

**C**ONGENITAL tumours of the neck, excluding cysts and inflammatory enlargements, are extremely rare, and mixed tumours of the neck, or teratomata, are probably the most infrequent of all congenital neck tumours. On this account the case reported is of interest. Most of the teratomata of the neck arise in the thyroid, but show numerous other forms of tissue, such as primitive thymus tissue, cartilaginous and bony tissue, gastric gland tissue, brain tissue, etc.

A search of the literature emphasizes their infrequent occurrence. Steffen,<sup>1</sup> in a compilation of 880 tumours of early life, found three cases arising in the thyroid (or 0.38 per cent). Poult,<sup>2</sup> reported a case in a child 6½ weeks old and collected from the literature five other cases of teratoma of the thyroid in children, and eight teratomata of the neck in children, these last not being connected with the thyroid. Of the latter group, some were external pedunculated tumours. One ruptured during delivery and contained bones and hair; another recurred several times after operation, and contained bones, teeth and striped muscle. Flesch and Winternitz<sup>3</sup> reported two cases, one in a female of eight months and another in a female of two months. In both cases the tumour had replaced the thyroid isthmus.

Hunziker<sup>4</sup> reported a triphyllie tumour of the neck, which was so large that perforation of the cranium was performed to complete delivery. Hunziker regarded such mal-developments as due to tissue misplaced by the formation of the gill-clefts. Ehlers<sup>5</sup> reported a tridermic teratoma of the neck removed surgically from the right side of the neck of a male child of nine weeks. He ascribed the mixed tumours of the neck and thyroid to tissue misplaced by the descent of the middle thyroid "anlage" which forms the isthmus.

In 1887 Sir Frederick Treves<sup>6</sup> at a meeting of the Pathological Society of London, showed a specimen of cartilaginous tumour observed in a girl aged three. "It was situated on the left side of the neck, and had been noticed from

birth; it was just over the sternal end of the sterno-mastoid muscle. When removed it was seen to be a round rod, flattened at the end towards the sterno-clavicular articulation. It was in the line of the fourth branchial cleft. A fissure or tag of skin in this situation was not uncommon, but a subcutaneous, cartilaginous mass was most unusual, except in connection with the walls of a fistula or with a skin tag. A fibrous cord connected with the mass passed deeply towards the spinal column. The President recalled no similar case of cartilaginous growth without a fistula. Mr. Bland Sutton said that he had seen a young woman in whom there was a large mass on each side of the neck at the anterior aspect of the sterno-mastoid muscles resembling and probably representing supernumerary auricles. Mr. Birkett had described a very similar case in the *Transactions of the Society.*"

F. Bolton Carter<sup>7</sup> reported a case as follows: "The child, a female, was born at full term with a large multilocular semi-cystic, semi-solid tumour, of about the size of a small coconut, occupying the whole of the front of the neck. It caused no trouble during parturition. The child only lived one month, the mass being dissected out after death; the hyoid bone was partly included within its structure and most of the muscles of the front of the neck were inserted and lost in the tumour. Microscopically, it was seen to consist of glandular spaces lined with epithelium, cartilage, fibrous, and connective tissue and was described by Mr. J. H. Targett of the Clinical Research Association as a true teratoma of the neck."

D. W. Daniels<sup>8</sup> reports another case in the *British Journal of Surgery*, "A male child was born on May 30, 1927, having a large swelling of the left side of the neck. This extended from the ramus of the jaw above to just above the clavicle below. It varied in consistency, in places being hard and in others fluctuating. It did not extend beyond the middle line. As the child grew the tumour kept pace, and, projecting

under the jaw, interfered with feeding. It was decided that removal should be undertaken.

On July 7th, Dr. S. Littlewood anaesthetized the child, and, with the assistance of Dr. G. T. Elder, the growth was removed. The tumour was in the left lobe of the thyroid gland—in fact it made up the whole of that lobe, so far as could be seen. There may have been some normal thyroid tissue behind, but it was not apparent. Enucleation was possible to a great extent, except where the superior and middle thyroid arteries ran into the growth with a certain amount of tissue. There was very little haemorrhage, but at this stage the child was in a poor condition, so the operation was concluded by clamping and ligaturing the vessels at the posterior border. The child picked up rapidly after the operation, but showed chest signs twenty-four hours later and died on July 9th.

*Pathological Report.*—The tumour was about four inches long and was shaped like a potato. It contained some cysts. A specimen was submitted to the Clinical Research Association, and Dr. E. W. Bowell reported as follows: "The tissue does not resemble normal thyroid even in its embryonic form. It consists of a fine reticulum composed of relatively large cells with branching cytoplasm; a few leucocytes are seen wandering in its meshes. This structure occurs in regular masses which show some appearance of twisting as though they belonged to a more complex organ. Blood vessels are scantily represented, except in the central parts of the twisted structure and in the loosely made capsule of fibrous tissue which encloses it. Here and there are seen irregularly shaped spaces lined with a special epithelium, which in favourable cases shows large round nuclei like those of the typical thyroid gland, lying at the base of an elongated clear cytoplasm resembling that of a mucinous epithelium. In some places the epithelium appears to be ciliated. The tissue is abnormal and may be called a teratoma. It resembled the primitive thymus in several particulars and may be a displaced portion of that organ. There is no evidence, in the tissue itself, that it is malignant."

The mixed tumours of infancy and childhood occur in many locations, the urogenital tumours being the most frequent and the kidney much the most frequent location. The teratomata at

the poles of the body occur next in frequency and of these the cranial teratomata are the most complex and serious from an operative point of view.

The branchial cysts and fistulae are not included in the mixed tumours of the neck. They occur usually in the second, third, and fourth branchial clefts, which have their external orifices along the anterior margin of the sternomastoid muscle. The opening of the second cleft is at the level of the angle of the jaw and a fistula in this location gives most trouble. Internally it opens into the tonsillar space. The removal of the fistula and closure of the pharyngeal opening is a most difficult surgical procedure, as the tract is usually described as passing into the pharynx between the external and internal carotid arteries. The third and fourth clefts enter the upper part of the pharynx and the superior laryngeal nerve may be injured in attempting to remove fistulae. The cysts of the second cleft are rather common and may be difficult to distinguish from a node in this location on account of the thickness of the wall which is composed of fibrous, lymphoid, and epithelial coats.

The mixed tumours of childhood are frequently present at birth and have been described in fetuses as early as the third month of pregnancy. These tumours may be regarded as congenital, even though, through delayed development, they are not observed until late childhood or adult life.

The terms teratoid tumour, teratoma, embryoma or dermoid have been used to describe such growths and attempts have been made to differentiate between them, but these terms are for practical purposes synonymous. Probably the term "mixed tumour" is the most comprehensive, as designating a tumour showing more than one derivative of a single germ layer—or derivatives of more than one germ layer.

I have reported the cases given above in detail as there are so few in medical literature.

#### CASE REPORT

My own case was in a boy of five years, seen first in October, 1928. He gave a history of a congenital tumour of the neck which, on account of its size, caused some discomfort during infancy but at the time of examination was producing no clinical manifestations. The mother said there was slight wheezing from birth until the child reached three years of age. There was some inconvenience and gulping while nursing, but at



FIG. 1



FIG. 2

present there is no difficulty in swallowing. The family history was negative. The birth was normal and the physical development had progressed satisfactorily, the patient being a well developed, bright and handsome boy. The voice was clear and had never been husky. The laryngoscopic examination was negative.

The tumour of the neck was an irregular one in the region of the thyroid gland. It measured  $3\frac{1}{4} \times 2 \times 1\frac{3}{4}$  inches and extended across the middle line on both sides. It was more prominent on the left side but extended well over the right side below. It felt like a hard cartilaginous irregular mass of tissue which was freely movable. The upper level of the tumour was at the upper border of the thyroid cartilage. The mass could almost be picked up from the surrounding structures, but it was impossible to make out definitely that it was not attached posteriorly to the thyroid cartilage. The x-ray report was as follows: "Clinically, this patient has a hard, irregular tumour in the neck. Films were taken to show neck and thorax. The thorax is negative; the bones are normal; the thymus is not enlarged. The trachea is straight except for outlines of soft tissue tumour. No deposits or anything pathological could be made out."

The photographs give a very good idea of the size and character of the tumour.

Silica or quartz dust will aggravate tuberculosis of the lungs more than any other known dust, Dr. Leroy U. Gardner, of the Saranac Lake Laboratories, reported to the National Tuberculosis Association meeting. The great hardness of the silica dust is responsible for its greater aggravating effect. Silica or quartz dust is harder even than the dust from granite or carborundum. The mechanical stimulus of these hard particles causes changes in the cells and eventually restores an environ-

We advised an exploratory operation with removal of the tumour. The parents, on account of the child's good health and absence of disability, decided to delay operation, as we could not assure them that the tumour did not extend into the deep tissues of the neck. From the general development of the child one can assume that the thyroid gland is functioning normally. At the date of presenting this paper the child was in good health.

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ment favourable to the growth of bacteria. Inhalation of the quartz dust affects the disease even when it is in an advanced stage of healing. It appears to encourage the growth of tubercle bacilli and creates conditions favourable to their spread. Experiments with coal dust failed to produce any aggravation of the disease, so that the effect is directly due to the silica dust and not to dust itself.—*Science*, May 31, 1929.

## Case Reports

### A CASE OF CHORION-EPITHELIOMA IN THE MALE

By D'ARCY PRENDERGAST, B.A., M.B.,  
M.R.C.P. (LOND.),

Toronto

The chorion-epithelioma is a tumour which occurs in women in relation to pregnancy. It arises from chorionic tissue in the uterus, and, while far from common, is not very rare. This tumour may, however, occasionally arise from a teratoma occurring in either sex and in any part of the body. What particular tissue in the teratoma is responsible for it is still a matter of some discussion. The testicle is the most common site for teratomata in the male, and as might be expected is also the most common place for chorion-epithelioma in the male. The occurrence of this type of new growth in the male is exceedingly rare. The first case was recognized and reported in 1902, and up to April of the present year there is a total of only 118 cases on record.

That the relation of chorion-epithelioma in the male to the similar growth in the female is neither superficial nor accidental is shown by the fact that in three male cases there was activity of the breasts with secretion of colostrum. This indicates what a wide influence on the general body metabolism may be exercised by teromatous tissues. In this connection Handfield-Jones suggests the interesting thought that a teratoma might conceivably conceal enough thyroid tissue to cause clinical hyperthyroidism.

Chorion-epithelioma in the male has rarely if ever been recognized during life. On account of the peculiarly invasive characteristics of this tumour metastasis is usually early. As in the case of all testicular malignant growths, secondaries occur in the retroperitoneal lymph-nodes and the lungs, and somewhat less frequently in the liver and kidneys. The sites of these metastases unfortunately are all difficult of surgical approach so that treatment is palliative at best.

The case here reported is of interest not only

on account of its rarity, but also because of the puzzling clinical picture it presented. The testicles were neither enlarged nor the cause of any symptoms, so they were, unfortunately, not particularly examined. It may, of course, very well be that the origin of the tumour was in some part of the body other than the testicle. In two cases on record chorion-epithelioma occurred in teratomata in such an unusual situation as the pineal gland.

*History.*—The patient was a Pole, 30 years of age. His complaint was nausea and abdominal pain of ten days' duration. He had been perfectly well previously, apart from a slight loss of appetite for four months. Language difficulties prevented the obtaining of a detailed history.

*Examination.*—The patient was of a sallow colour, seemed to be in pain, and was obviously acutely ill. The liver was tender and large, reaching to the umbilicus. It was possible to palpate several rounded elevations on the surface. A firm oblong mass, about 2 inches by 4, was felt deep in the abdomen in the right lower quadrant. It did not seem to be connected to the liver and did not move on respiration. There was no jaundice. The white cell count was 14,000 per c.mm., with 85 per cent polymorphonuclears. The temperature was of the septic type, reaching 102 degrees at night and becoming almost normal by morning. No other abnormalities were found on physical examination.

A diagnosis was made of pylephlebitis and liver abscess, in spite of the absence of an apparent origin for such a condition.

Stereoscopic plates were made of the chest, with the very surprising result that groups of small circular densities were found in both lung bases. These were diagnosed by the radiologist, Dr. Shannon, as secondary new growth.

The patient's condition became rapidly worse. A mild jaundice developed, with a Van den Bergh reading of 2.8 units. At frequent intervals he vomited dark brown fluid and on one or two occasions actual blood. He died seven days after admission, within three weeks

of the time from which he dated his first symptoms.

*Autopsy.*—Permission was obtained for a small abdominal incision only. The liver was very much enlarged. Most of its substance was replaced by large nodules of dark red friable tumour mass, containing much extravasated blood. In the caecal region was a mass of similar nature about the size of a small orange. It had invaded the lumen of both the sigmoid colon and cæcum, and was densely adherent to the retroperitoneal tissues in that neighbourhood. The lung bases both contained smaller nodules of similar tumour mass. The stomach, kidneys, and spleen showed no gross change. No signs of teratoma were found.

Microscopic examination showed the unmistakable histological picture of chorion-epithelioma, with the two characteristic cell-types of the chorionic villus, the small polygonal cells representing the layer of Langhans, and the large syncytial masses.

#### A CASE OF PARKINSONIAN RIGIDITY TREATED WITH STRAMONIUM

By ROSS ROBERTSON, M.B.,

Wellington, Ont.

In the January issue of *Abstracts of Current Public Health Literature*, I read with interest of the treatment of Parkinsonism with stramonium. Shortly afterwards a patient presented himself with the typical Parkinsonian syndrome, except that the "lead pipe" rigidity was entirely confined to the right side.

*History.*—He gave a history of having had perfect health previous to an attack of "influenza" six years ago. The patient states that during this attack he was unconscious for two successive nights. His convalescence was rapid and he noticed no impairment for about two years, when his movements gradually became slow and difficult, especially in his right arm and leg. During the next four years his right arm became practically useless so that he took from two to three minutes to write his name and required assistance in eating and dressing.

*Physical Examination.*—When examined he walked very slowly, with his right leg dragging, and sat down or rose from a chair with painful

deliberation. There was an external squint of the right eye and frequent spasmoidic twitchings of the eyelid. He complained of double vision. His expression was "mask like" and his speech was slow and halting. There was excessive salivation with drooling. His mentality was normal, except that he was absent-minded. There was marked lead-pipe rigidity of the right arm and leg, a coarse tremor of both hands, and all reflexes were exaggerated. The patient weighed 155 lbs. and was 29 years old.

*Treatment.*—He was started on one grain of powdered stramonium leaves (U.S.P.) three times a day, dispensed in capsules. The dose was increased by one grain each day until he was taking two grains every hour (8 times). He had been on this dose but two days when the squint and rigidity entirely disappeared, so that he could walk quite rapidly and use his right hand for writing, eating, cranking a car, etc. The tremor remained the same. However, after a few days he began to complain of blurred vision, dry mouth, diarrhoea, and incontinence. His pulse was running about 120. The dose was reduced to three grains three times a day. The above toxic symptoms disappeared in forty-eight hours, but the rigidity, etc., began to re-appear and the dose was increased by one grain every three days, until a dose of three grains every three hours (5 times) was attained. This dose has been continued without any further symptoms of poisoning and the patient has remained well, being able to do light work and drive a car without difficulty. If he forgets to take two or three doses his movements immediately begin to slow up, but otherwise there has been no decrease in the action of the drug.

#### A CASE OF AMYOTONIA CONGENITA

By R. ROY MACGREGOR, M.D.,

Kingston

This disease was first described by Oppenheim in 1900, and the majority of the cases reported are of congenital origin, although a small percentage have been described as coming on quite suddenly after certain illnesses such as measles.

The morbid influences which are active in intra-uterine life to produce this condition still remain a mystery to medical science. The con-

dition is believed by most observers to represent rather a failure of certain nervous and muscular developments than a degeneration, although the changes noted pathologically in the nervous system and muscles suggest an atrophy secondary to spinal change.

Greenfield and Stern\* describe the pathology of the condition as follows:-

"To the naked eye the only change visible is the atrophy of the anterior roots of the spinal canal and the paleness and smallness of the muscles. Changes under the microscope are degeneration and reduction in the number of the ventral horn cells of the spinal cord, atrophy of the ventral roots, thinness of the peripheral nerves and atrophic changes in the muscles. There is demyelination of many of the fibres of the ventral roots and the number of thin poorly myelinated fibres in the peripheral nerves is usually conspicuous."

The clinical picture of this disorder, usually observed from birth, is characterized by a symmetrical atrophy and flaccidity of the muscles of the body, which are extremely weak without paralysis. This weakness and atrophy is most pronounced in the limbs and to a less degree in the trunk and face. Mentality and sensibility are unimpaired and the deep reflexes are lost. From reports of cases reviewed the tendency to improve is much less than the textbooks would lead us to believe. One observer of long experience states that he has seen little improvement and no recoveries from this disorder. The severe cases usually die from pulmonary disease early in life, on account of intercostal muscular weakness. Mild cases may be confused with the muscular weakness of rachitis, but in time this condition becomes clearly defined by its lack of improvement under treatment, and may persist into adult life with slight or no improvement.

A mother brought a baby aged four months to my office, complaining that the baby had very little power of movement in its limbs. It was the second child of a family of two children; the first child was alive and well; parents alive and well, and of French-Canadian descent.

The mother said that, although the child had always nursed well at the breast and had grown well, the limbs and back of the child had been very weak from birth.

*Examination.*-A female child, of four months, in apparently a good state of nutrition; its weight was 14 lb. 6 oz.; the circumference of the head was 15 inches. The child lay in any position in which he was placed, in a limp, lifeless manner. Very weak muscular movements were noticeable in the arms and fingers, but none in the lower limbs. The muscles of the body were unusually soft to the touch and seemed to be wholly lacking in tone. The knee-jerks could not be obtained. No impairment of cutaneous sensibility could be discovered. No atrophy of the musculature was apparent, except that the neck appeared to be smaller than normal in circumference. There was considerable retraction of the chest wall with each respiration, due apparently to intercostal weakness. A slight depression deformity of the ribs was apparent. The muscular movements of the face did not seem to be impaired, and nursing at the breast was accomplished with normal vigour. The infant was unable to hold up its head, and when put into a sitting posture and support was withdrawn crumpled up into a helpless flaccid posture. The limbs of the body could be placed with ease into contortionistic positions. With the child in the sitting position the body could be doubled forward, after the manner of a jack-knife, until the face was between the feet, and the feet could be extended to right angles with the legs.

Three months later the baby was brought into hospital with bronchitis. There had been some improvement in the movements of the upper limbs. The retraction depression of the chest seemed to be more marked. There had been a gain in weight of three pounds. It would be expected that broncho-pneumonia and death should supervene in such a case as this, but recovery took place in a week's time, in spite of the fact that the infant possessed insufficient power to clear mucus from the throat and bronchial tubes by coughing, and the intercostal muscles were obviously very weak.

\* Greenfield and Stern, *Brain* 1: 652, 1927.

## Editorial

### THE ANNUAL MEETING IN MONTREAL

AT any scientific meeting, the actual program is naturally and properly the most important item. Inasmuch, however, as the majority of the papers presented at the recent annual meeting of The Canadian Medical Association in Montreal will, in due course, appear in the *Journal*, the profession may be left to judge for themselves, the exceptional excellence of the whole program.

In industrial life we often see a by-product rivalling in importance the main line of production. To many of those who were fortunately able to attend the Montreal meeting, the thoughtful appraisal of these secondary products seems well worth while.

Glancing over the scientific program we find England and the United States, France and Italy all efficiently represented by gifted and talented workers. The Canadian Medical Association was Confederation's twin and as Canada is to-day growing to national status in world politics, so, too, is our Medical Association assuming its proper place in the international world of medical progress. Our welcome visitors were at once a recognition of accomplishment and a splendid stimulus and encouragement for the future.

The Council of the Canadian Medical Association consists of 138 members. That the profession at large appreciates very clearly the importance of the Association to them individually and to the profession as a whole, that they are beginning to realize what organization in Canadian medicine means, that they value this and are supporting these ideals was clearly shown by the fact that over 100 duly accredited members of the Council were present for the business sessions.

Important announcements of very far-reaching significance were made regarding periodic health insurance; the holding in Canada of the primary examinations for the Fellowship of The Royal College of Surgeons; and the establishing of a Royal College of Physicians and Surgeons of Canada.

There was a very interesting and encouraging enthusiasm amongst those who were attending Council sessions for the first time

and the hope is here expressed that these men will be given an opportunity at the earliest moment to present to their local associations, a résumé of the program presented for their consideration at the Council sessions.

The Hobbies Exhibit deserves special mention. The happy choice of a room so near to the general Convention Hall was rewarded by a large and continuous attendance. The Exhibit—the second to be held, the first having been at the Toronto Meeting in 1927—was varied and stimulating. It was a revelation to all to find how many gifted and versatile members there are in the Canadian profession. These men, active though they are in the many details of medical practice, still find time to round out their lives and attain outstanding excellence in painting and wood carving; in historical writing and sculpture; in music and in photography; in etching and philately; in radio and horticulture. The hope was expressed on every side that this would be an annual exhibit.

It is difficult to restrain one's enthusiasm when speaking of the Association's infant child—the Historical Section. Through the gracious courtesy of The Hotel Dieu, The Montreal General Hospital, McGill University and the St. Sulpice Library, an exhibition of unusual character and great historical interest was presented in such an admirable manner that it is doubtful if anyone who even visited one of the exhibits will ever quite forget the charm and spell of that past which is so vital a part of our present every day life.

And what of the oldest child of Canadian Medicine and of Confederation—the Bonne Entente—the rapprochement between French and British medicine in Canada? It, too, has grown in stature and in promise. Slow of growth, it has been nurtured and guided by the thoughtful members of all the races that blend in making Canada a nation. This meeting might be taken as recognition of the coming of age of the Bonne Entente so eloquently sponsored by Dr. Bazin and

Dr. Primrose, and by Dr. B. G. Bourgeois, President of The Province of Quebec Medical Association. It is to-day the heir apparent of Canadian medicine—Canadian medicine that is distinctive and that will be a definite entity in the medical world because it has the traditions of French and British medicine behind it.

No visitor can look back on the Montreal meeting without wishing for the opportunity to personally thank the citizens of that city—French and English—for their gracious, courteous and generous hospitality. Montreal gave us whole-heartedly of its best and Medical Canada will not forget.

H. H. MURPHY

### THEORIES ABOUT THE FORMATION OF GALL STONES

THE formation of gall stones is a rather fascinating study and much experimental work has been done with the idea of establishing an adequate explanation for the occurrence of these remarkable and troublesome concretions. When all is said and done, however, the unbiased student of the literature is likely to come to the conclusion that the last word has not been said. In fact, while recent workers, in the light of what has been discovered in regard to the origin and disposition of that widely disseminated substance cholesterol, have greatly discounted the dicta originally laid down by Naunyn, yet they have by no means attained unanimity among themselves. One may be excused if at the present time one assumes an attitude of incredulity.

Naunyn, in 1892\*, stated that the only cause of biliary calculosis that could be positively established was bile-stasis, but, at the same time, he admitted that this factor was not in itself sufficient to account for those cases where gall stones were present within the gall-bladder in great numbers. He, therefore, considered a second factor to be an ascending infection of the biliary passages with *B. coli*, derived from the intestine. The mechanism in brief was as follows. The infective agent set up a catarrhal inflammation of the mucous membrane of the gall-bladder, and as a result of this cholesterol in large amount, and also calcium salts, were excreted by the inflamed mucosa. Desquamated mucosal cells and precipitated bile-pigment or calcium formed a nucleus about which the stone could form. In favour of this view is the fact that Chiari found *B. typhosus* and *B. coli* in the centre of certain gall stones, and the additional fact

that, experimentally, the growth of *B. coli* in bile causes a granular precipitation. Later investigations, also, established that in the presence of protein crystalline materials, like cholesterol, were laid down, not a regular crystals but as truncated plates. All this was accepted teaching until twenty years ago.

Then, Aschoff and Bacmeister\*, in the light of later work in bacteriology and metabolism, were enabled to throw new light on the problem, as a result of which Naunyn's theory had to be considerably modified. The main thesis, as set forth by Aschoff and Bacmeister, is that microbial infection is not necessary for the formation of all gall stones, and that, in consequence, gall stones come under two categories, one of inflammatory and the other of non-inflammatory origin. In the latter category are the pure cholesterol and the bilirubin-calcium stones. Notwithstanding the great authority of these two observers, it seems fairly open to doubt that, assuming it to be a fact that stones may result from metabolic disturbances without the activities of bacteria, stones could exist for long without exciting an inflammatory reaction on the part of the biliary passages. Swelling of the mucosa, desquamation of cells, excess of mucin, all would tend to promote biliary stasis, and biliary stasis means infection. Aschoff and Bacmeister's classification appears to us to be too academic. Nevertheless, the newer work on cholesterol metabolism has to be reckoned with.

Cholesterol is a constituent of all cells, and, probably, in the final analysis is derived from the food. When cells disintegrate cholesterol is liberated, but this substance

\* Naunyn, B., Klinik der Cholelithiasis, 1892.

\* Aschoff, L., and Baemeister, A., Die Cholelithiasis, 1909.

need not be excreted as a waste product. Most of it can be utilized over again in the building up of new cells. Much, doubtless, is excreted by way of the bile, but some of this is re-absorbed from the intestine. There is, also, evidence that the body can synthesize cholesterol, since on various diets the output is found to be greater than the intake. In the blood stream about four-fifths of the cholesterol circulates as esters of higher fatty acids, the remaining fifth being free cholesterol. In the bile almost all of the cholesterol is in the free state, so that one function of the liver is to de-ester the cholesterol-esters. Certain observers, particularly of the Russian school, notably, Anitschkow and Chalatow\*, have shown that the cholesterol content of the blood can be greatly increased by feeding cholesterol. Cell metabolism and peculiarities of diet may, then, account for considerable amounts of cholesterol not only in the blood but in the bile. Naunyn's hypothesis that the cholesterol of the bile is a secretion from the epithelium of the gall bladder seems, as a result of all this, to be discounted, yet it cannot blithely be discarded. Is the cholesterol of the gall-bladder bile an excretion from the mucosal cells, a product of disintegration, or is it the result of the concentrating powers of the gall-bladder? Aschoff thinks the latter.

The cholesterol content of the blood is increased in a number of conditions, such as pregnancy, general adiposity, diabetes mellitus, and chronic interstitial nephritis, and it is well known that gall stones are more common in these circumstances.

On the other hand, Naunyn and Kretz have found it impossible to precipitate cholesterol in sterile bile, and Kuru, in studying cholesterol stones found in them a thin capsular layer of fibrin, which he was inclined to regard as a result of inflammation.

\* Anitschkow and Chalaton, Beitr. z. path. Anat. med. z. allg. Path. **56**: 379, 1913.

Stasis undoubtedly favours infection, infection favours cell disintegration, and cell disintegration means increased liberation of cholesterol. Add to this a diet rich in cholesterol, or certain errors in the metabolism of cholesterol, and we have the chief factors in the formation of gall stones.

Within the last few years considerable difference of opinion has arisen as to the functions of the gall-bladder. The commonly accepted view is that the gall-bladder is a reservoir which has the power of supplying concentrated bile to the intestine whenever such is required. A quite recent view is that the bile enters the gall-bladder not to be stored there and expelled on occasion but to be resorbed *in toto* by the mucosa of the gall-bladder. Important biliary constituents are thus restored to the blood. Also, the gall-bladder acts as a sort of pressure tank to regulate the pressure within the biliary system while the sphincter of the ductus choledochus is closed. A chief exponent of this view is Bela Halpert,\* whose experiments lead him to believe that when the bile leaves the gall-bladder through the cystic duct this is the exception rather than rule. It must be said, however, that the available evidence, obtained from animal experimentation, x-ray examination, and the experience of surgeons, points strongly to the older view. Professor Babkin and Dr. Webster,† in a recent contribution to this *Journal*, strongly controvert this idea of Halpert's. Certainly, were Halpert correct, one would expect gall stones to be more common than they are. More light is needed on the whole matter. Naunyn is not yet discredited.

A. G. N

\* Halpert, B., and Hanke, M. T., *Am. J. Physiol.* **88**: 351, March 1929.

† Babkin, B., and Webster, D. R., *Canad. M. Ass. J.* **2**: 32, July 1929.

## THE EFFECTS OF SMALL AMOUNTS OF CARBON MONOXIDE ON THE HUMAN ORGANISM

ACCOUNTS of fatalities, either accidental or suicidal, from poisoning by carbon monoxide appear almost daily in the newspapers and there is, in consequence, considerable public interest in the matter. But what is perhaps of even greater importance is the question of moderate intoxication of thousands of garage workers and traffic policemen who are daily exposed to small concentrations of the gas. Several studies, notably those of Bloomfield and Isbell\* and Connolly, Martinek and Aeberly† have shown that whereas the hazard to pedestrians is not very great at the present time, the hazard to policemen and particularly to garage workers is very real. In the case of garage workers fatalities are not very common, to be sure, but the fact of their exposure to varying concentrations of carbon monoxide raises the question as to whether permanent effects are to be anticipated. A recent publication of the United States Public Health Service‡ throws some light upon this.

Six students from the University of Pittsburgh volunteered for an experiment which was designed to show the effects on them of small concentrations of carbon monoxide from the exhaust of a gasoline engine. The students were exposed from four to seven hours a day for sixty-eight days to concentrations of 2, 3 and 4 parts of gas to 10,000 parts of air. Control experiments were also conducted, in which no exhaust gas at all was used, or in which exhaust gas with a negligible amount of carbon monoxide was used. If it be remembered that carbon monoxide has a haemoglobin combining power nearly three hundred times that of oxygen it will be seen that 2, 3 and 4 parts of carbon monoxide per 10,000 parts of air are equivalent to 600, 900 and 1200 parts per 10,000 of oxygen, with respect to its ability to combine with

haemoglobin. The oxygen percentage in the air is about 20, or 2000 parts per 10,000. On theoretical grounds, a carbon monoxide concentration of 7 per 10,000 would be equivalent, so far as its haemoglobin-combining power is concerned, to 2100 parts per 10,000 of oxygen, and in the case of an individual exposed to such concentrations, we would expect his blood to become 50 per cent saturated after a state of equilibrium had been reached. The Pittsburgh investigators found that when the students were exposed to a concentration of 2 parts of carbon monoxide per 10,000 of air their blood became 25 per cent saturated in about five hours; exposure to 3 parts per 10,000 resulted in 30 per cent saturation in about five hours; and exposure to 4 parts per 10,000 resulted in 35 per cent saturation in five hours. It took from four to five hours for equilibrium to be established.

Headache was, perhaps, the most characteristic symptom of early intoxication. Frontal headache usually occurred when the blood became 18 to 20 per cent saturated; occipital headache and dizziness very often developed when the percentage saturation rose to 30. It is generally held that carbon monoxide exercises its toxic effects by virtue of its affinity for haemoglobin. It is not a tissue poison; it is not even a poison for the red blood cell; for once the red cell is free from carbon monoxide it is just as efficient as it ever was. According to the modern view the disability from which an individual poisoned with carbon monoxide suffers is due, therefore, to the temporary anaemia and to nothing else. Just why headache should be a prominent symptom is not quite clear. An individual with his blood 30 per cent saturated with carbon monoxide has 70 per cent of his haemoglobin available for carrying oxygen. Certainly headache is not a prominent symptom of moderate anaemia. It has been suggested that other gases present in the exhaust of gasoline engines may be responsible for some of the symptoms of exhaust gas poisoning. The investigations in Pittsburgh indicate that this is not so, for the subjects were exposed to the exhaust gas

\* The Problem of Automobile Exhaust Gas in Streets and Repair Shops of Large Cities, Public Health Reports, March 30, 1928.

† The Carbon Monoxide Hazard in City Streets, *J. Am. Pub. Health Ass.*, November 1928.

‡ Effect of Repeated Daily Exposure of Several Hours to Small Amounts of Automobile Exhaust Gas, *Pub. Health Bull.*, No. 186, U.S. Public Health Service, Washington, D.C.

of a gasoline engine in which the carbon monoxide had been reduced to a negligible amount, and in this case there was no increase in the number of headaches among the students, and none developed occipital headaches.

During the sixty-eight days of the Pittsburgh experiment there was no apparent deterioration in the health of the students, as judged by weight, appetite, and physical strength. An interesting observation was the fact that in five of the six students the percentage of haemoglobin increased very definitely. Most of the students showed an increase in the red cell count as well. It is a matter for speculation whether the increase would have continued, or would have been sustained even if the experiment had proceeded for a year, but this observation bears out the impression of many that continued exposure to small amounts of carbon monoxide does result in a mild polycythaemia. It constitutes, in fact, about the only evidence we have that there is such a thing as chronic carbon monoxide poisoning.

Psychological tests of steadiness, memory, co-ordination, and arithmetic were also carried out during this experiment, but these showed no significant change. This is probably a criticism of the tests, however, since it is reasonable to suppose that in the presence of dizziness and headache the subject's mental ability would be somewhat impaired. There does not appear to be at this time any reliable test for measuring quantitatively the increase or decrease of an individual's ability to do mental work.

In general, the experiment showed that, with the exception of the alteration in the haemoglobin and the number of red blood cells, no demonstrable change occurred in the six students. Whether the blood changes

are significant remains to be seen. Sixty-eight days is a long period in which to conduct such a study, but compared with actual practice it is very short. Furthermore, the concentrations of the gas used were lower than occur in some garages. Other observations have shown that the concentrations of carbon monoxide may be as high as 11 parts per 10,000 in certain garages. This, incidentally, is probably actually lethal if breathed for four or five hours. Whether a chronic impairment in physique occurs or not remains to be demonstrated, but certainly it is hardly justifiable to allow men to work under conditions which inevitably produce malaise and discomfort.

In streets the evidence at hand is to the effect that no important hazard exists at present. With the increasing use of automobiles and particularly if the proposed "double deck" street comes into use, the problem may become pressing. The proposal made some years ago by Yandell Henderson, that the exhaust pipes of automobiles be continued upwards to the top of cars is worthy of consideration. In garages adequate ventilation appears to be the solution. This may be accomplished locally or generally. The installation of local exhausts at suitable places to be attached to the exhaust pipes of motor cars while the engine is running is undoubtedly the best means. General ventilation by means of blowers and exhausts, whereby the air of the place is changed from six to ten times an hour, is valuable and is the method adopted in vehicular tunnels. There is no real evidence that ozonizers are of any practical value in oxidizing carbon monoxide to carbon dioxide.

FRANK G. PEDLEY

## Editorial Comments

### AN EPIZOOTIC AMONG RODENTS IN SOUTH AFRICA

It is gradually becoming borne in upon us that the rodent is of more importance to the human race than his small size and relative insignificance would suggest. The rôle of the rat and the ground squirrel in connection with the perpetuation and spread of plague, has been, of course, well known for years; and the part played by the rabbit in connection with tularæmia is just now becoming appreciated.

Recent studies have been made in the De Aar region of South Africa of a very fatal epizootic that has been devastating a small veld rodent known as the Namaqua gerbille (*Desmodillus auricularis*). The appearance of the malady in these small animals was strongly suggestive of plague, and it came somewhat as a surprise to the laboratory workers to find that this was not the actual form of infection. The anxiety at first felt was increased for the reason that there were, during the same period, two cases of undoubted bubonic plague in human beings. Eventually it was discovered that the organism at work was a member of the Pasteurella group. It is possibly a new species, and, if this proves to be the case, the name *Pasteurella desmodilli* has been proposed for it.

With the occurrence of a few additional cases of true plague in human beings there has been considerable ground for worry. However, the destruction of the gerbille in such large numbers must, for a time at least, lessen greatly the pos-

sibility of the true plague becoming epidemic and getting out of hand.

A.G.N.

### SCIENCE, RELIGION, AND STAINED GLASS

Stained glass windows in churches usually depict incidents in the Sacred Story, or the imaginary persons of the Saints. To a large extent they are conventionalized in design. Since the Great War, soldiers, sailors, and flags, more or less idealized, have also appeared in windows. Here the sentiment is also on an elevated plane. Occasionally, a coloured window is allegorical in subject, as in the case of one in Southwark Cathedral, London, which depicts Shakespeare's Seven Ages of Man.

It is but rarely that more prosaic, everyday subjects are translated into stained glass. Probably the only instance of this to be found in England is in the Church of Stoke Poges, the churchyard of which was the inspiration of Gray's Elegy, where in one of the small windows is the representation of a somewhat archaic-looking bicycle. Now, we learn that four stained glass windows have been placed in the Third Unitarian Church, Chicago, symbolic of Science, Industry, Art and Education, and suggesting that religion is the integration of all life. In the window representing science we see a microscope and a retort, a frank recognition of the fact that religion must realize the implications of the scientific world-view.

A.G.N.

## Special Articles

### THE PREVENTION OF FILM FIRES

BY HARVEY AGNEW, M.D.

*Department of Hospital Service.*

#### PART I

Few disasters have stirred the pulse of the world and set everyone to serious thought to the same degree as has the recent unfortunate experience of our confrères in Cleveland. Other catastrophes have caused greater loss of life and property damage, or covered much greater territory, but the thought-provoking factor which has stirred us so profoundly in this instance is the alarming reflection that the next prey to this demon may be our own hospital with its precious charge of helpless inmates.

That this fear is not without foundation can be accepted in a great many Canadian communities. The fire hazard in many of our hospitals is exceedingly high. While visiting our

hospitals in various parts of Canada the writer has seen many examples of improperly protected x-ray departments. Frequently located in the basement of old or non-fireproof buildings, with films stored on wooden shelves in unventilated chambers, with improvised electrical wiring and with cigarette smoking a common occurrence, these departments constitute all too often a distinct fire menace. The daily handling of nitro films without accident is very liable to make even the most careful forget that they are handling a medium that is really gunpowder.

In a recent hospital fire study<sup>1</sup> the astounding facts were revealed that one hospital fire in every four results in total destruction and that eight people die on the average in each institutional fire! It has been calculated that one hospital a day is the sacrifice contributed by Canada and the United States to this Minotaur.<sup>2</sup>

Many false rumors concerning the origin of the Cleveland fire were freely circulated, but the

essential features are contained in the following excerpts from the official report of the National Fire Protection Association:

#### THE COAL ROOM

"The room which had been designed as a coal bin had been converted for storage. It was a brick enclosure  $19 \times 24\frac{1}{2}$  feet, a little over 9 feet high, and without windows. The pipe tunnel extending around the basement opened directly into a corner of this room. Nitrocellulose x-ray film, size  $14 \times 17$  inches, in paper envelopes, was stored in this room, mostly on wooden shelves, but some in steel filing cases. Estimates place the amount present between 3 and 4 tons. In spite of this tremendous quantity, the room was not sprinklered nor were vents to the outside provided. A disused coal chute which might have acted as a vent was closed on the outside by a heavy iron door cover and by a wooden shutter on the inside. A doorway connecting with the heater room was equipped with a fire door.

Lighting was by ordinary electric bulbs on pendant cords. A 4-inch steam line bringing steam, at a reported pressure of from 45 to 65 pounds per square inch, from the near-by hospital passed overhead through the coal room. This pipe was about a foot above the film storage shelves and a vertical section passed within a few inches of the shelves. Where this and several other pipes passed through the walls, holes had been subsequently bricked up around the pipes.

#### WHAT HAPPENED

On Wednesday morning, May 15th, a steam-fitter arrived at the Clinic to repair a leak reported in a steam pipe in the film storage room. At 8:45 a.m. he entered the room and, hearing steam escaping, proceeded to unwrap the magnesia covering from a 4-inch main steam supply pipe to locate the leak. This pipe is said to be the one located directly over or near the film storage racks. The steamfitter could find no leak, but the room was said to be extremely hot.

Two hours later he returned on a second call and found the room filled with steam. He went to the hospital building to have the steam supply shut off. This the engineer did. Twenty minutes later, or at about 11:15 a.m., when the steamfitter returned again, he heard a "sputtering hiss" and saw a cloud of yellow smoke 4 or 5 feet in diameter at the ceiling of the film room. Obtaining a  $2\frac{1}{2}$ -gallon soda and acid type extinguisher near by, he directed the stream with no apparent effect at what he supposed was a fire. Fumes poured forth faster and faster. Being nearly overcome and having exhausted the extinguisher, he had just reached the door of the film room when an explosion occurred. The fire door remained open. He managed to reach a window and was blown through it by a second explosion.

#### HOW THE FIRE STARTED

It is obvious that the fire came from the decomposition of the nitrocellulose film. Pyroxylin compounds like nitrocellulose film are chemically unstable at elevated temperatures and decompose at temperatures as low as  $300^{\circ}\text{F}$ . This decomposition generates further heat and liberates carbon monoxide, various oxides of nitrogen and other gasses which are both poisonous and highly explosive. Exactly how the decomposition was induced is not yet definitely known. The following are possibilities arranged roughly in the order of their probability.

(a) *Electric Light Bulb*.—About where the steamfitter was working was a pendant bulb said to be 100 watts capacity. The cord was draped around a disused steam main, and the bulb hung just above the top of a shelf used for film storage. Had there been several envelopes of film on this shelf the bulb would have been resting directly on the film. Enough heat would thus have been available to start decomposition of the film. A bulb on an extension cord was provided and habitually

used by the x-ray technician who filed the films. This bulb may have been used by the steamfitter and left in contact with some of the films.

(b) *Steam Pipe*.—Although there was no leak found, there was certainly steam escaping, and a jet impinging on a film may have induced decomposition. The heat from the steam pipes, which with steam at 65 pounds pressure would have been at about  $312^{\circ}\text{F}$ , would have been ample to start the decomposition. The steam pipe passed so close to the film storage shelves at one point that a bare fitting was within a few inches.

(c) *Matches or Smoking*.—The newspapers reported that an inspection agency had found a package of cigarettes in the coal room a few weeks before the fire. A discarded match, cigarette or tobacco ash is at least a possible source of ignition.

Ignition of the gases, causing the several explosions, may have resulted from the heat generated by the decomposition of the film. There was an automatic gas water heater just outside the room in the basement, the pilot light of which is believed to have been lighted, and which is a possible source of ignition. . . . .

#### THE LOSS OF LIFE

The deadly fumes, forced through the pipe openings to every part of the building, caught many persons unaware. Several doctors and nurses collapsed at their desks. Others, aware of the gases at first by their irritating odors, gasped and collapsed as they sought air. Others could struggle to a window, a door or to a stairway before their lives were snuffed out. Firemen entering the front stair tower from the roof found 16 bodies strewn at intervals along that stair. Probably half of the persons present died an almost instant death.

While the exact cause of the deaths is uncertain, most of them resulted apparently from the carbon monoxide and nitrogen peroxide from the burning film. Carbon monoxide kills without warning. Nitrogen peroxide tends to form nitric acid in the lungs."

In the Syracuse<sup>3</sup> fire, while no definite cause was discovered, two steam pipes passing through the closet were thought to be responsible for the decomposition. Escaping steam from an underground steam pipe outside of the building wall caused the spontaneous fire in a recent Detroit hospital fire. In the Albany<sup>4</sup> x-ray fire of unknown origin, eight deaths occurred in the 48 hours subsequent to the fire, although "these were not all caused by the fire." It is worthy of note that in none of the previous fires did the gassing affect the patients so seriously. This may be due to the vagaries and complexities of gas formation under varying conditions, to the concentration and to the unusually rapid dissemination of the fumes under pressure to almost every room through the pipe openings leading to wash basins and medicine cabinets.

#### THE PREVENTION OF FILM FIRES

Nitrate films are a hazard at all three stages, before exposure, in the current file and when stored for reference.

*Unexposed films*.—This supply should be the minimum commensurate with the turnover and the time distance from the supply house. Self-closing metal containers preferably ray-proof should be used. Film scrap and waste should be carefully removed.

**Current file.**—This file should be kept at a minimum and should be so located that, while accessible, it is not exposed to the dangers incidental to the viewing room. This file cannot be relegated to the roof or an outbuilding but should be in a separate room where the most rigid fire precautions can be observed. Shelf construction, ventilation, doors, etc., should be as described below under "Reference File." Where the number of such films is small, instead of a vault, a heat-insulated metal safe vented through the wall to the outside would suffice. Many cabinets are seen in use which are not ventilated at all and one hospital is known to have a heavy steel burglar-proof office safe with six inch walls, a safe which was not only expensive, considering its limited space, but provided no ventilation whatsoever.

**Reference File.**—Where films are kept for several years, they should be stored, not in the hospital basement, but in a separate structure at least one hundred feet from the hospital proper, or if this be not feasible, as in a crowded city district, then a special vault should be built on the roof. According to the Eastman recommendations,<sup>5</sup> four basic requirements should be satisfied: (1) The room should be of fire-resistant construction. (2) The room must have a direct outlet to the outer air. (3) There should be a Class B, self-closing fire door at communication to building proper. (4) The room should be additionally protected by automatic sprinkler heads.

The room should be built of brick or concrete. The vent should be open at all times and must not be too small. A circular opening of 13½ inches is sufficient for 1,000 pounds of film. It is considered correct to provide 140 square inches of vent for each 1,000 pounds of film stored; or this area may be calculated by allowing one-half square inch per cubic foot of storage space.<sup>6</sup> In Germany, the roof vaults have glass windows on two sides which will blow out in case of an explosion, thus ensuring egress of fumes.

**Heating** should be by hot water. If steam is used, it should not be stored near the radiators, which should be protected. As few hot pipes as possible should be permitted in the room and these should be most carefully insulated. The films in Cleveland were stated to be within 7½ inches of the high pressure steam pipe.

**Sprinklers** will not only reduce the rate of fire spread, but may save many valuable films, and, by dissolving gases out of the fumes, lessen the danger to inmates. Simple sprinkler heads are not expensive; and can be installed for eight or ten dollars apiece. In twenty-three recent fires in sprinklered hospitals, each fire was extinguished at the beginning by the sprinklers and not a single life was lost.<sup>1</sup>

Shelves should be of metal or other fire resisting material and should be partitioned at

frequent intervals. Many roentgenologists prefer to leave them open and slatted to ensure thorough air circulation.

Small hospitals with a very limited collection of films may feel justified in storing them in a metal cabinet in the main building; but these smaller structures are seldom fire proof and an outbuilding, even if only a metal garage, should be erected. Cold does not injure films.

#### GENERAL PRECAUTIONS

Fire extinguishers should be readily available. If of the acid-soda type, they must be carefully refilled each year and the nozzle kept clear of corrosion. The small glass containers of carbon tetrachloride are very handy and efficacious. It is well to remember that the fire hose so neatly coiled in the corridor wall is frequently so devitalized that the slightest water pressure would burst it in a score of places. Extension electric lights should be forbidden and only safety vapour-proof bulbs should be used. The glass in film illuminators should not get hot to the touch. Films should not be left on display. "No smoking" signs should be prominently displayed and rigidly enforced.

(The "Safety Film" and the resolutions of the recent fire conference at Ottawa will be discussed in the next issue).

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#### REQUIREMENTS FOR MEDICAL LICENSURE\*

BY W. H. HATTIE, M.D.,

*Faculty of Medicine, Dalhousie University,  
Halifax, N.S.*

The amazing rapidity with which knowledge applicable to medical practice has been and continues to be accumulating makes the task of medical teacher and medical student alike most formidable. The marvellous triumphs of recent years have not only given a tremendous impetus to research but have let loose such a flood of benefactions as to establish research on a quite unprecedented scale. The effect of this on the medical curriculum of the future cannot be clearly foreseen, but we must expect results which will greatly modify present conceptions,

\* Conference of Canadian Universities, London, Ont., May 31-June 2, 1927.

and we cannot flatter ourselves that all the teaching of to-day will apply to the medical practice of even the next decade.

It is evident, then, that in the teaching of medicine there should always be thought of future developments. It may be fairly assumed that what we are fond of terming the "basic" subjects will remain basic, but this does not preclude modification of our ideas in respect of their relative importance and the manner in which they are to be presented. Obviously, the teacher must take note of every real advance and of everything that promises to be serviceable to the future practitioner. The medical curriculum can never be static, and if it is not to become as fearsome as that planned for Gargantua there must be constant winnowing of the material used by the teacher. Every year there must be new matter presented, more or less change of emphasis, more or less elision. The student at graduation must have a fair comprehension of the state of medicine as it is at the time. It is thus that the teacher must prepare the student for the practice of his profession.

But while the teacher is thus occupied, the student has to think of more than preparation for practice. There are the examinations to be passed before he can obtain his degree, and the examinations to be passed before he can obtain his license. Preparation for practice and preparation for examinations are not one and the same thing, and most teachers know students whose first concern is preparation for examinations. Nor is this a matter to cause great wonderment. The examination for the degree is generally regarded as the lesser of the two evils. In this the student meets men with whom he is familiar. For the license, however, he must present himself before examiners who are not all engaged in teaching, who will know him only as number such-and-such (perhaps thirteen), and some of whom are very likely to value answers which include the most modern views more conservatively than his teachers would. If he be of the timid sort, he will not acquit himself before such an examiner as he would before one with whom he is acquainted. Examinations, even under the most favourable circumstances, are sufficiently disconcerting, and one whose *tubera ischii* are already tender from much sitting may be pardoned his inability to anticipate the possibility of even a figurative kicking-out without wincing. Only those who are brought into very intimate contact with students can appreciate the dread in which examinations are held, the greatness of the relief experienced when they are completed successfully, or the bitterness of the disappointment caused by failure. The stress of such an ordeal should not be lightly regarded, and the wisdom of the practice of subjecting students to a post-graduate examination under conditions which are seldom if ever more exact-

ing, although usually more trying, than those of the University may well be questioned.

It is true that until within quite recent years the product of many medical schools on this continent was such that the public interest demanded an independent examination before a license to practice could safely be issued. This scarcely applies to Canadian schools, which have always maintained a reasonably high standard, but rather to certain inferior non-Canadian schools which attracted the less discriminating of our own youth. Until recently, moreover, a much larger proportion of our young Canadians chose to study without our borders than is the case to-day. At present we can educate in Canada all that are needed to make good the wastage in the ranks of the profession, and we can claim without hesitation that our Canadian medical schools rank well with those of any other nation. Except for graduates of other than Canadian schools there no longer exists the need for the duplication of examinations with all that that entails.

I am inclined to go farther and to contend that the present system is not only unnecessarily cumbersome and burdensome, but that it is really a hindrance to medical education. My feeling is that if the student were relieved of the dread of examinations by men who are not teachers, he would prepare less for examination and more for the actual practice of his profession, and that the teacher, relieved of the need of presenting possibly antiquated matter in order that the not-quite-up-to-date examiner may be satisfied, would be able to deal more thoroughly with really essential material. Perhaps, too, it would be easier for the schools to break away from the pernicious lock-step if they were not obliged to keep an eye to the requirements of provincial or other examining boards.

I trust that I will not be understood as implying that non-teachers are necessarily incompetent to examine. The point that I wish to make is, of course, that the man engaged in teaching is perforce compelled to be more keenly alert to the newer developments than one who has less insistent stimulus to watchfulness of what is going on in all parts of the medical field. The latter cannot reasonably be expected to be as fully *au fait* with the disclosures of the research laboratory and the research clinic as the former, and he must necessarily set questions which will be answered in a way which his own knowledge will permit him to value properly. However good and practical his questions may be, they may fail to bring forth very important information which the student has acquired.

Modern conditions give a clearer meaning to Sam Weller's characterization of medical students as "sawbones in barnacles." For them it is both the devil, as represented by a

type of examination which changes comparatively little, and the ever restless, ever changing, deep sea of the medical curriculum. If they choose to serve the devil, they will stand still in the sea—where standing favours incrustation with barnacles.

Now to my claim that the examiners who are best qualified to pass upon the fitness of men for practice are those who, through intimate contact with such men in class room, laboratory and clinic, have learned their aptitudes, their personalities, and their characters, I wish to add my contention that no medical school should be permitted to continue if it graduates men who are not reasonably well prepared to enter upon the practice of medicine. I contend that the State should exercise its control primarily upon the school and only secondarily upon the graduate. The school can discipline the undergraduate only; if discipline is required thereafter, the licensing body alone has jurisdiction. Moreover, there may be justification for a further test of candidates for licensure who come from foreign schools over which no Canadian state agency can have control. Consequently there is need for continuance of the several licensing bodies. But our Canadian schools can, and in my opinion should, be placed under such official supervision by the State as will ensure their proper conduct and eliminate the need for more than the regular university examinations.

In the United Kingdom such supervision is exercised by the General Medical Council, and graduates of schools which maintain a standard satisfactory to the Council are admitted to licensure without further examination. Why should a similar system not meet the needs of Canada? It is surely not impossible to secure such amendments to the federal and provincial Medical Acts as would permit the Medical Council of Canada to function along lines very similar to, although they could not be identical with, those of the General Medical Council.

If the Medical Council of Canada should arrange for suitable appraisal of the courses and examinations of the several universities of the Dominion, with the understanding that its certificate would be granted to graduates of schools which could be approved by the appraisers, surely such certificate should be acceptable to the provincial licensing boards. Such an arrangement would imply that the approval of the appraisers would be withheld from any school which did not maintain a sufficiently high standard, and would thus prove a strong stimulus to the very best effort on the part of every school.

Other arguments in favour of such an arrangement are not hard to discover. The cost of licensure would almost certainly be reduced—a matter of no small importance to many of the most deserving aspirants to a place in the medical world. Money thus saved would be available for the prosecution of graduate studies. As already suggested, it might aid us in getting rid of the lock-step into which we fell so readily and from which, I fancy, we all wish to escape. Whether we wish to admit it or not, I am inclined to believe that all our schools are, to a greater or less degree, held in leash by the licensing boards. Relief from such restrictions would allow both school and student greater latitude to develop strong points than is possible under existing conditions.

I have, for these reasons, and for others of perhaps less moment, to suggest that this Committee make representation to the Conference of Canadian Universities that each university should give consideration to the advisability of requesting the Medical Council of Canada to take the initiative in the endeavour to effect an arrangement which will remove the necessity of anything beyond university examinations in the case of graduates of Canadian medical schools.

**THE VALUE OF JOINT AUSCULTATION.**—Auscultation of joints may reveal a very early stage of roughness or grating, which is not recognizable by other means. As age advances the grating appears to increase steadily until it is manifest to touch and the unaided ear; in the most advanced stages its cause is visible in skinogram as the joint changes of osteo-arthritis. These joint sounds are to be heard, by stethoscope, in a large number of hospital cases, unselected save for sex and age, and admitted for other than joint affections. The number of affected joints, as a whole, preponderate in the female as 55.7 per cent to 44.3 per cent, the most markedly affected joints, however, existing in the female as 4.3 to 1 male. These figures suggest that the more arduous work of the male is not a factor in producing these

sounds. A possible past or present focus existed in 80 per cent of the cases examined. The number of joints with auscultatory changes becomes more numerous as age advances—from 1.5 per cent to 81.5 per cent. The sounds heard, judging from their wide distribution through many joints, are probably the result of changes produced by a blood-borne infection or intoxication. This is confirmed by the fact that the stethoscope will also often reveal, in the same subject, many other joints in which disease is latent, and as yet unheralded by discomfort or pain. The removal of a focus may render a manifest joint again latent, but it will still be audible to the stethoscope and sometimes to touch.—*Lancet*, 1920.

## Men and Books

### THE SO-CALLED SCANZONI MANŒUVRE

BY THOMAS GIBSON, M.B., C.M.

*Lecturer on the History of Medicine, Queen's University, Kingston.*

I wonder if any of our Canadian obstetricians have noticed that in the letter-press opposite plate No. xxi of Smellie's "Tables," the manœuvre, called in modern text-books Scanzoni's, is described nearly one hundred years before the date of Scanzoni's chief publication of 1852.

Plate xxi is a magnificently engraved presentation of a large fetus, its head coming by the vertex in the left occipito-posterior position, with Smellie's pelvic-curved forceps applied to the sides of the head. On the opposite page are the following words explaining the treatment of such a case: "If the child cannot be delivered by the labour-pains, or turned and brought footling, the forceps are to be applied to the head as it presents; but if that cannot be done without running the risk of tearing the perineum, and even the vagina and rectum of the woman, the forehead must be turned to the sacrum. To do this more effectually, the operator must grasp firmly the handles of the forceps, and at the same time pushing upwards, raise the head as high as possible, in order to turn the forehead to one side, by which it is brought into the natural position; this done, the head may be brought down and delivered as in table xvi."

Note L, "Sometimes the forehead may be moved to the natural position by the assistance of the fingers, or only one blade of the forceps."

Plate xvi shows the application of the forceps to a left occipito-anterior position of a vertex presentation with the head half-way through the bony pelvis. To follow the suggested advice and at the same time act in accordance with the figures in plates xxi and xvi would involve the removal of the curved forceps of plate xxi and the re-application of them as in plate xvi. Is not this, in condensed form, "Scanzoni's manœuvre"?

Plate xxvi is an outline drawing of an arrested mento-posterior case. The text suggests the use of the forceps, applied to the sides of the head so as, by their means, to push up the head as high as possible and then rotate it, to bring the chin towards the front. Rotation is to be aided by the pressure of two fingers applied to the chin of the child.

Case-record No. 258 in Smellie's "Collection" (McClintock's edition, New Sydenham Society, vol. ii, p. 338) describes how he was called, in the year 1745, by a midwife to see a woman who had been in strong labour all night. He found the bregma "at the left groin" and diagnosed a posterior occiput as the cause of the delay.

Putting the patient in the lithotomy position, he applied the forceps to the sides of the head. He first tried to bring about a face delivery by pulling backwards to extend the head as far as possible. This failing, he tried to bring down the occiput, but without result.

"While I paused a little, considering what method I should take, I luckily thought of trying to raise the head with the forceps, and turn the forehead to the left side of the brim of the pelvis where it was widest, an expedient which I immediately executed with greater ease than I expected. I then brought down the vertex to the right ischium, turned it below the pubes, and the forehead into the hollow of the sacrum, and safely delivered the head by pulling it up from the perineum and over the pubes. This method succeeding so well gave me great joy, and was the first hint in consequence of which I deviated from the common method of pulling forcibly along and fixing the forceps at random on the head. My eyes were now opened to a new improvement on the method of using the forceps in this position, as well as in all others when the head presents."

These artless words of Smellie's give us the first recorded correction of an arrested occipito-posterior case by rotation with the forceps. Occurring in the year 1745 this case must have been delivered with Smellie's first short straight forceps, made by him to replace Duse's French model which he had found unsatisfactory. The "English" lock was introduced by Smellie about the year 1744. The pelvic curve was added to the form of the forceps by Levret and Smellie independently, in 1751. Both were probably anticipated by Pugh, and Smellie takes no credit for priority, "they were contrived by himself and other practitioners." Their special use was "to take a better hold of the head when presenting and high up in the pelvis." To meet this emergency still better, the new model was made longer than the first, which measured but eleven and a half inches.

Smellie's "Tables" were published in 1754, and in one of the notes attached to Plate xxi he says the rotation of the posterior occiput may be made with either the straight or the curved forceps. But he also advises that, when the forehead has been turned to the side of the pelvis, the head may be pulled down, "as shown in Table xvi." It is unlikely that an obstetrician so acute as Smellie would fail to observe that it was more convenient to re-apply the curved forceps at a point in the descent when the pelvic curve would be a detriment and not an advantage.

In later discussions as to the merits of the two types of forceps, straight and pelvic-curved, McClintock says (Smellie's Midwifery, vol. i, p. 260): "Its (the straight) application is certainly simpler, and it can more safely follow the rotation of the

head during its descent through the pelvis," and Leishman says (Midwifery, p. 528) "If it be found necessary to alter the position of the head by rotation, this can only be effected by the straight instrument."

I received on May 13th, from Dr. J. Whitridge Williams, of Baltimore, a letter in which the following statement is made: "I have just looked up the matter of the application of the forceps to an obliquely posterior ear in Smellie's Tables and I think you are entirely correct in stating that he antedated Scanzoni by nearly one hundred years. This is extraordinarily interesting, as it shows what a keen observer Smellie was."

#### J. J. WATERSTON: A MAN BORN OUT OF HIS TIME

J. J. Waterston, born in Edinburgh in 1811 and educated in mathematics and physics under Sir John Leslie, at the age of 21 came up to London to train as a civil engineer. Having qualified, he sought for work that would enable him to follow his hobby—pure science. The post of naval instructor to the East India Company's cadets answered his purpose, "giving him leisure and no anxiety, care, or responsibility, and at the same time enabling him to lay up a little for old age." The rest of his life was devoted mainly to scientific thought. In his first serious adventure—namely, an attempt to express mental phenomena in terms of physical changes—he perceived that the excessive refinement of structural adaptations exhibited by living organisms must depend ultimately on molecular adaptations. To molecules, therefore, he turned his attention, since he felt that, in whatever way the phenomena of nature were examined, molecularity was the grand terminus to which all investigations tended. Thus he was led to the study of molecular physics, and in particular to the physics of gases; and in this branch he exhibited a penetration which marks him out as one of the greatest thinkers of the nineteenth century. He discovered that the physical laws common to all gases and vapours could be brought under one broad generalization on the assumption that a gas consists of molecules travelling with enormous rapidity in every possible direction. A carefully written paper, in which this dynamical theory of gases and of heat and temperature was formulated with great precision and clearness, was sent in to the Royal Society in the year 1845—and rejected. The two referees appointed to examine it pronounced it unworthy of publication, one of them expressing the opinion that it was "nothing but nonsense, unfit even for reading before the Society." In itself the incident may be considered trivial, but its practical effect was permanently to eclipse Waterston's splendid generalization. By the rules of the Society publication of the paper elsewhere was prohibited, and although Water-

ston made some attempts to draw attention to the subject, his efforts were without effect. The discovery was made afresh by other men some fifteen years later, and before the end of the century the dynamical theory had become a commonplace in ordinary textbooks. The incident has a pleasant sequel. A few years after Waterston's death Lord Rayleigh discovered the now celebrated paper in the archives of the Royal Society, and published it in the *Philosophical Transactions* (1892), with a generous appreciation of Waterston's work; and recently Professor J. S. Haldane has edited the collected works,\* prefaced by an interesting biography of Waterston, whom he actually ranks highest in the brilliant group of physicists turned out in the early part of the last century by the Scottish universities, including such men as Brewster, Forbes, Thomas Graham, Andrews, Rankine, Kelvin, Clerk Maxwell, Tait, and Balfour Stewart.—*Brit. M. J.*, 1: 614, Mar. 30, 1929.

#### GOLDSMITH AS A MEDICAL MAN

Goldsmith and his connection with the medical profession was the subject given recently at the medical school of Trinity College, Dublin, by Dr. T. P. G. Kirkpatrick, Honorary Lecturer in the History of Medicine.

The lecturer said that Goldsmith entered Trinity College as a sizar at the age of fifteen, on June 11th, 1745. Both as a child and a schoolboy he was said to be dull and stupid, but the fact that at fifteen years of age he had learned enough Greek and Latin to pass the entrance examination to Trinity as a sizar did not lend much support to that view. There were no contemporary records of Goldsmith, such as they had of his contemporary and great compatriot Burke, who, though a fellow student, did not seem to have known him; nor did Goldsmith seem ever to have joined Burke in the debates of the Historical Society. That Goldsmith's life in college was miserable was unlikely from all that was known of his character. He left college with a competent knowledge of the classics, and also with a much wider knowledge of life than was usual for one who had just graduated. A man who had sold his bedclothes to shelter the derelict might well have learned more of the problems of life than the scholar whose polished periods were to procure for him a bishopric. They had not a trace of evidence that Goldsmith had any idea of following the medical profession until shortly before he set out for Edinburgh, in the autumn of 1752; nor, indeed, was there any evidence that he ever returned to Trinity College after he took his degree in 1750. Although Goldsmith had referred to the lecturers and

\* *The Collected Scientific Papers of John James Waterston*. Edited, with a biography, by J. S. Haldane, M.D., LL.D., F.R.S. Edinburgh and London: Oliver and Boyd. 1928. (Med. 8vo, pp. lxii + 709; illustrated. 25s. net).

professors in Edinburgh, he never mentioned any medical lecturer in Trinity. There was no evidence that Goldsmith, when he started the study of medicine, did not intend to become a doctor. He attended with considerable regularity lectures in Edinburgh, but it seemed strange that he should have left Edinburgh without taking a degree in medicine. At that time there was no strict curriculum or regulation for candidates seeking medical degrees, since the statute which afterwards governed such matters was not formulated till 1767. It must be remembered, however, that at Edinburgh University it was then the exception rather than the rule for students to proceed to a degree either in arts or medicine. It could not be assumed, the lecturer went on, that Goldsmith did not intend to pursue the practice of medicine because he did not seek a degree in Edinburgh, or that his studies there had not qualified him to do so. From Paris Goldsmith went to Berne, Basle and Geneva, and thence into Northern Italy. The question of where Goldsmith obtained his M.B. degree has been much discussed and investigated; at the Section of the History of Medicine of the Royal Society of Medicine in 1914 it was suggested that he deceived the University of Oxford when, on February 14th, 1769, he got an *ad eundem* degree of M.B. by describing himself as an M.B. of Dublin. Dr. Kirkpatrick, after careful consideration of all the circumstances—among them the fact that medical degrees were sometimes granted by the University of Dublin without examination, as occurred in the case of Richard Brocklesby, also a friend of Dr. Samuel Johnson—suggests, though without dogmatism, the possibility that Goldsmith may have had the M.B. degree of Dublin University conferred upon him *in absentia*. He was reported to have spent some months in Padua, where it was suggested he took a medical degree. For this suggestion there was no evidence, nor was there any that the University of Padua granted the degree of Bachelor of Medicine at all. Having referred to Goldsmith's return from the Continent to England, Dr. Kirkpatrick went on to say that some time subsequently his old friend and fellow student at Edinburgh—Dr. Fanu Sleigh—met and assisted him to start in medical practice in a small way at Bankside, in Southwark, and that, writing in reference to this, Goldsmith said: "By a very little practice

and a very little reputation as an author I made a shift to live." The little practice in medicine gave him ample time, however, for writing. Through the acquaintance with Dr. Milner, one of the most interesting episodes in Goldsmith's medical career occurred—his proposed appointment as medical officer in the East India Company at Coromandel, for which he had the more or less definite promise of an appointment at £100 a year, with the prospect of a private practice, that was believed would bring it up to £1,000. After the offer was postponed, the idea was ultimately cancelled by the Surgeons' Hall on the ground that he was not qualified. The cause of this rejection was not recorded. On March 31st, 1763, Goldsmith signed an agreement with James Dodsley, the publisher, to write a book called *A Chronological History of the Lives of Eminent Persons of Great Britain and Ireland*. In this agreement, written in his own hand, and preserved in the British Museum, Goldsmith describes himself as "Oliver Goldsmith, M.B." As far as was known this was the first occasion on which he was recorded as a bachelor in medicine, although it was not uncommon to find him referred to as "Doctor Goldsmith," or described as "Oliver Goldsmith, M.B." It was reasonable to suppose that in describing himself in an official document as "M.B." Goldsmith did so correctly, and that at that time he had, in fact, been granted that degree. The records of many universities had been searched, but in none had there been found any documentary evidence for a degree in medicine granted to Goldsmith. Dr. Kirkpatrick then referred to a subsequent attempt of Goldsmith to supplement his income by medical practice, and how it ended, and he concluded with a description of Goldsmith's death in 1774. There must always be some doubt about the nature of his final illness and his own responsibility for its termination. Against the advice of Drs. Hawes and George Fordyce, he obstinately persisted in dosing himself with Dr. Robert James's fever powder, though Dr. Kirkpatrick believes that neither the powder nor any other treatment employed can be justly blamed, and cautiously suggests that Goldsmith's chief complaint was some form of chronic nephritis, which terminated in uræmia.—*Brit. M. J.*, 1: 469, March 9, 1929; *ibid.* 1: 1049, June 8, 1929.

Four factors responsible for the gratifying decline in the tuberculosis death rate during the last thirty years are the elevated standard of living, improved sanitary control, more adequate hospital facilities and public health education, according to Dr. Louis I. Dublin, statistician of the Metropolitan Life Insurance Company, who recently addressed the National Tuberculosis Association. Continuation of the public health and social service activi-

ties responsible for much of the decline will probably further decrease the tuberculosis death rate to a negligible point. The lowest tuberculosis death rate was recorded for the year 1928. The decline since 1900 has been steady and ever-accelerating. Thirty years ago tuberculosis brought death to nearly two and a half times as many persons per 100,000 as now.—*Science*, May 31, 1929.

## Association Notes

### MESSAGE FROM HIS ROYAL HIGHNESS THE PRINCE OF WALES

Acting upon instructions of Council, at our recent Annual Meeting in Montreal, the following message of greeting was cabled to the Prince of Wales:—

“Canadian Medical Association, in sixtieth annual session assembled at Montreal, desires to extend to Your Royal Highness heartiest birthday greetings.”

On June 24th, the following reply was received from the Private Secretary to His Royal Highness:—

“Please convey to members Canadian Medical Association Prince of Wales' sincere thanks for their kind birthday greetings.”

### GREETINGS FROM CHINA MEDICAL ASSOCIATION

The following message by night-letter was received from Dr. E. R. Cunningham, the chosen

representative of the China Medical Association:

“Greetings and sincerest good wishes for the best annual meeting in history of your Association. Congratulations on continued growth and achievement in scientific medicine. May the friendship between our Associations become channel for mutual understanding and goodwill between China and Canada. Regret inability to communicate greetings in person. On behalf of the China Medical Association.”

Later on Dr. Cunningham writes:

“Further, on behalf of the Canadian Members of the China Medical Association, especially for those engaged in the Honan and West China fields of the United Church of Canada—let me voice the appreciation of the gracious act of the Canadian Medical Association in sending the *Canadian Medical Journal* to the respective mission stations where Canadian graduates are at work. We do appreciate the *Journal* and derive much benefit, inspiration and pleasure in the perusal of its pages.”

## Hospital Service Department Notes

### IMPRESSIONS OF THE FIRST INTER-NATIONAL HOSPITAL CONGRESS

The first hospital convention on an international basis was held in Atlantic City from June 13th to 15th. The result of two years' assiduous preparation on both sides of the Atlantic, this congress was a definite success and warranted the effort expended. Delegates were present from forty-four countries. They included representatives from South Africa, Australia, New Zealand, Japan, China, Greece, Italy, Hungary, Finland, Poland, Norway, Sweden, Spain, Great Britain, Germany, France, Czecho-Slovakia and nearly all countries of South, Central and North America. Holland sent over a large delegation. The general interest in hospitals now taken everywhere is attested by the fact that the Egyptian Government sent four delegates to this congress, Dr. A. K. Henry, the Professor of Surgery at Cairo, Dr. A. F. El Rasheed Bey, the Public Health Administrator, Mr. Aly Farid, the Director of Works, and Mr. C. R. Bawden, Inspector of the State Buildings Department. The Government is planning a great medical school in Cairo, including a 1,300-bed hospital with an outpatient department having capacity for 3,000 patients per day.

Canadian speakers on the program were Dr. J. J. Heagerty, Chief Executive Assistant, and Mr. Evan Parry, Supervising Architect of the Department of Pensions and National Health, Ottawa; Dr. Geo. F. Stephens, of Winnipeg, Dr. A. K. Haywood of Montreal; and Dr. Harvey Agnew of the Canadian Medical Association. Other Canadians in attendance were Mr. W. R. Chenoweth, of the Royal Victoria Hospital, Montreal; Mr. A. J. Swanson, of the Toronto Western Hospital; Dr. D. M. Robertson, of the Ottawa Civic Hospital; Mr. Henry Rowland, of the Isolation Hospital, Toronto; and Miss Dorothy Dart, of the Ontario Hospital Association.

The language handicap did not prove insurmountable at all, largely because of the admirable efforts of Dr. René Sand, of Belgium, the Chairman. Addresses were delivered in English, French or German and concise translations were then made by Dr. Sand.

It is a matter of regret that more of our members, who are interested in their local hospitals, could not have heard some of the discussions. Dr. S. S. Goldwater, the well-known hospital consultant, deplored the present day tendency to incorporate in new hospitals more features than can be economically utilized. He also warned against too much centralization,

the erection of great medical centres with resultant lack of co-ordination and personal contact, and doubted the value of overstandardization, where it interferes with originality and initiative. Mr. Parry, of Ottawa, struck a responsive note when he longed for a well regulated earthquake every twenty-five years to enable our hospitals to keep pace with the changing types of construction. Dr. A. V. Aviles, of Ecuador, strongly opposed their system of cheap "pay clinics." The doctors are thought to get one-half of the twenty-five cents fee, whereas they actually get nothing. Therefore, he advocated the free clinic. This system must not be confused with the pay-diagnostic clinics now being tried out in North America. Here the medical staffs are paid and the charges are calculated upon a cost basis.

Reference to the beneficent effect of magnesium chloride in cases of dementia praecox was made by Dr. J. J. Heagerty of Ottawa. Most patients given this treatment show a marked physical improvement and a definite mental clearance. He deplored our pessimism respecting mental disease and thought that our exaggeration of the influence of heredity, was due in part to our general acceptance of certain unconfirmed family trees.

In this connection, the paper by Professor Julius Tandler, the well-known sociologist of Vienna, was unusually illuminating, as were also the movie films which he presented at the closing banquet. In Vienna, a suspected mental patient is now examined by an official examiner before being definitely committed. Observation wards are provided. This is much better than the system prevailing in many parts of Canada, where a practising physician, without special training and usually without hope of reward, must shoulder this moral and legal responsibility. Occupational therapy is developed much more than it is here. In one mental hospital of six thousand beds over 60 per cent of the patients are following occupations.

Dr. Tandler's work with school children is quite advanced and has been perfected under a Socialist Government, too. Twenty thousand school children are fed daily at noon from eighty kitchens at a charge of from nothing to three cents per week. They are not served mere "drinks" but are given seven hundred calorie meals. Every large apartment house has now a good day-nursery. Moreover, every child must learn to swim and for this purpose numerous "Freibaden" have been provided. Every child born in Vienna gets a free gift of a complete layette from the city.

Several innovations in other countries may interest our readers. In France, there is a Hospital Society for Mutual Insurance against accidents, open to hospital staffs and internes;

this scheme has been so successful that the insurance will shortly be extended to include sickness. Also the Hospital Union of South-East France has practised co-operative purchasing for ten years—a movement recently advocated in Canada. This Hospital Supply Society has been unusually successful. The British Hospitals Association now have organized examinations for their hospital administration certificate. The first examination is held after one year's service and the final examination after three years' service. The Warsaw Medical Society is now organizing a national hospital association, and is arranging for the publication of a hospital review and for the holding of a congress of hospital doctors. In Turkey, all doctors and nurses on hospital staffs are appointed directly by the Minister of Health and Social Welfare.

Those interested in nursing education, and in creating still higher nursing standards, will note the remark of Dr. Wm. Schroeder, Commissioner of Hospitals for New York City, that it is their "hope to make the nurse's degree equal to that of the doctor." This policy is hardly akin to that of Mr. Hoadley in Alberta who favours a two-year course to bring nursing service within the reach of the general public. Also, it is now proposed to have centralized teaching for some twenty or more New York hospitals. This has been done for some years in Toronto and elsewhere and has proved quite successful.

There had been some doubt before the congress as to whether such a convention would be successful. That doubt was completely dispelled and it was the unanimous decision of the delegates to meet again in Vienna in 1931. Very fittingly Dr. René Sand was reappointed Chairman and Dr. E. H. Lewinsky-Corwin of New York City reappointed Secretary-General. We wish this movement every success in the future and hope that it will prove still another bond to link together the nations of the world.

HARVEY AGNEW

#### THE TRAVELLING DIETITIAN

One of the many special problems of the smaller hospitals has been to provide a proper dietetic service. Not only is it necessary that the dietetic service be efficient from the viewpoint of the patient, but also from that of the nurses in training and the graduates on the staff. Few hospitals of less than one hundred beds capacity feel justified in employing a fully qualified dietitian. Some hospitals of fifty beds or over have dietitian-housekeepers. The smaller hospitals cannot afford such assistance.

To meet this deficiency, a part-time, or travelling dietitian has been recommended. In Saskatchewan, where the hospital workers are

very active and enterprising, this principle has been put into practice. At the last meeting of the Saskatchewan Hospital Association, Miss A. C. Langley, the travelling dietitian, described her work, the direction of which comes under the jurisdiction of Dr. F. C. Middleton, the Acting Deputy Minister of Health. Miss Langley travels about the province, visiting the smaller hospitals, and spending in each institution whatever time she considers necessary. That there was sufficient need for this service has been amply proved. Some hospital administrators displayed very little interest in the preparation or serving of the food. In one hospital, the planning of the meals was left to the Chinese cook; in another the matron was on holidays, and had left a menu to be repeated or changed at the cook's discretion. This menu, for one week, included roast pork, fried liver and onions, meat pies, fried fish and pie for dessert at least twice! They had not had fresh vegetables or fresh fruit all summer. The cook had never made junket or a baked custard.

The travelling dietitian not only reorganizes the kitchen service, a task requiring considerable tact in many instances, but it has been necessary to give a series of lectures for the nursing staff. Most of these lectures are given

to graduate nurses, because in the Union Hospitals the nursing staff is composed of graduates. Many of these lectures are given in the evening and are attended, not only by the nurses, but by the cooks and, in several instances, by ladies from the town. Each nurse attending the classes is given typed sheets, listing recipes, standard diets and other data.

While the work in Saskatchewan has been directed under the ægis of the provincial government, there is no reason why small hospitals elsewhere, acting privately, could not band together in small groups and support a circulating dietitian who would spend a period of weeks in each hospital and conduct an intensive course in dietetics while there. She would direct the policy of the kitchen and the entire dietetic department, and could so arrange the schedules that this department would function efficiently while she would be absent giving her lectures and demonstrations in the other hospitals. Such a scheme would enable the smaller hospitals to give their patients an up-to-date dietetic service and their pupil nurses an excellent course of instruction, without the heavy financial burden of entirely supporting a dietitian.

## University Notes

### UNIVERSITY NOTES

#### McGill University

Dr. W. W. Chipman, one of Montreal's best known doctors and professor of obstetrics and gynaecology at McGill since 1912, has tendered his resignation to the board of governors of the university. Dr. Chipman is a native of the Maritime Provinces, having been born in Nova Scotia. He received his early education in Canada and then proceeded to Edinburgh University, where he obtained his Bachelor of Arts and Doctor of Medicine degrees. He graduated from Edinburgh in 1893 and later did post-graduate work in London, Paris, Vienna and Berlin. After graduation he was resident physician at the Edinburgh Royal Infirmary and the Royal Maternity Hospital and at the Bolton Infirmary. He returned to Canada at the close of the century and joined the teaching staff of the Medical Faculty of McGill University in 1900, being appointed demonstrator in gynaecology. In the same year he was also taken on the staff of the Royal Victoria Hospital. His appointment as professor of gynaecology came in 1910 and two years later he was named professor of obstetrics and gynaecology. Dr. Chipman is well known both on this continent and in Europe.

He has been president of the Montreal Medico Chirurgical Society of the American Gynaecological Club and of the American College of Physicians. He was made a F.R.C.S. by the University of Edinburgh and granted the honorary LL.D. degree by the University of Pittsburgh and Acadia University.

The Faculty of Medicine has received a gift of \$85,000 from the Rockefeller Foundation, to be used for research in experimental surgery. This gift is to be spread over a period of three years. Other gifts received are \$2,500 from Mr. Howard Murray for expenses in connection with the department of neuro-surgery, and the bequest of the medical books of the late Dr. F. S. Shepherd.

#### University of Alberta

Over 76 per cent of this year's students in Medicine who tried the examinations of the Medical Council of Canada, passed successfully. This is the fifth year since the final years in medicine were given in Edmonton, and the percentage of successful candidates at the Dominion Council Examinations indicates quite clearly that Alberta is taking her place in the list of successful medical universities.

### **Edinburgh University**

Sir Alfred Ewing, F.R.S., and Lady Ewing received many tokens of regard on the eve of the former's retirement from the position of Principal of Edinburgh University. In April the retiring Principal received the Freedom of the City of Edinburgh. On June 11th portraits of Sir Alfred in his robes as Vice-chancellor, painted in oils by Mr. Henry Lintott, B.S.A., were presented to the University and to Lady Ewing at a large and representative gathering of subscribers. A letter of apology for absence was read from the Earl of Balfour, Chancellor of the University. Lord Provost Sir Alexander Stevenson, in presenting the portrait to the University, referred to the services of Sir Alfred Ewing to the State, outstanding among which was his work at the Admiralty during the war, and to the University, which he was leaving after a period of unexampled development and

expansion. He was carrying with him into his retirement the affection and esteem of very many friends. Sir John Gilmour, the Lord Rector, accepted the portrait on behalf of the University. The Lord Provost then presented a smaller portrait of the Principal to Lady Ewing as a personal gift to herself from the subscribers. On June 14th Sir Alfred and Lady Ewing received parting gifts from the students at a great gathering in the McEwan Hall. Mr. D. E. Keir, senior president of the Students' Representative Council, and Miss C. Hogg, junior president, made the presentations. The Principal made a delightful and highly characteristic reply. Another honour conferred on Sir Alfred Ewing was the degree of Doctor of Science of Oxford University. On June 22nd a reception was held in the Old College, Edinburgh, to welcome Sir Thomas Holland, the new Principal, and Lady Holland.

## **Topics of Current Interest**

### **MEDICAL SCHOOLS AND HOSPITALS**

#### **AN AUSTRALIAN SURVEY**

During the past two or three years there has been much questioning in the State of Victoria on the future of the Melbourne Medical School and its relation to the hospitals for clinical instruction. We reviewed in our issue of November 12th, 1927 (p. 892), a report of three representatives of the State who had been sent upon a mission of inquiry to the United States of America and Canada to investigate related conditions in those countries. This report has now been issued for general information, and there is bound up with it a further report by Professor R. J. A. Berry,\* who formerly held the chair of anatomy in the University of Melbourne, and who was a member of the mission of inquiry.

He states that the war impressed upon all medical administrators the necessity for co-operation, the great value of the research hospital, and the vital importance of the medical centre devoted to community health. Yet in Melbourne today he finds a medical position that is the product and relic of mid-Victorian ideas. Medical education is carried out in a medical school that is detached from the clinical hospitals, and the several departments of the school are unrelated. The University has no control, direct or indirect, on the clinical hospitals; these have no common objective, and merely function as isolated and competitive units.

During his tour Professor Berry investigated 21 of the leading university medical schools of Canada, the United States, and Great Britain,

and some 115 institutions and hospitals. He gives a lucid and vivacious account of his observations. He maintains that everywhere he finds a change in the ideas that inspire hospital treatment and medical education. The objective of all medical effort is the patient. This conception demands unity of purpose, concentration of effort, and a constant investigation of the laws of health as well as the processes of disease. It is now universally recognized that medical research is an integral part of medical treatment, and consequently the modern idea requires the concentration on the one spot of all branches of medicine.

The examples Professor Berry gives of the vast equipment of certain of the Canadian and American medical centres are enough to arouse envy in the heart of many readers. But despite economic adversity, which he says is delaying advance in these islands, he finds concentration schemes in being in Aberdeen and Birmingham, and developments of pathological departments in the older universities of Oxford and Cambridge, which are practical proof of the community spirit in medicine. A change, also, he finds in building arrangements; there is concentration rather than dispersion. Instead of spreading the hospital building over a vast area the tendency in America is to build it up into the sky, and a picture is given of the New York State Psychiatric Institute and Hospital, which shows that it vies with the sky-scrappers. He indicates that this is not a mere fashion, but the expression of a real purpose. Hospital and school of medical and allied sciences are brought together in the one building.

"Anatomists and physiologists, pathologists and research fellows generally, may walk from their laboratories into the wards. The clinicians

\*Report on the Hospital-Medical School Problems of the State of Victoria. By Professor R. J. A. Berry, M.D. Melbourne, Victoria: H. J. Greene, Government printer. Pp. 39. Price 1s. 6d.

have all the medical scientific departments absolutely at hand, which means that the full resources of medicine are at the service of every patient irrespective of his means. Such a combination is stimulating in the highest degree to every medical officer in the associated departments, whilst the benefits to the patient are incalculable, and cannot be attained in their entirety in any other way."

Professor Berry has something to say on hospital policy. Brought up in this country, where the voluntary hospital is the pivot of hospital work, he finds other methods elsewhere which he believes to be better. He suggests that it is a mistake to look upon the hospital as a place for the treatment of the poor. He prefers the American practice, based upon the idea that a hospital should be for all.

"American medical and hospital administrators have clearly recognized the justice of this contention. It is to-day the bounden duty of medicine to give every type of patient access to its hospitals, for only there can medicine give its best; but the labourer is worthy of his hire, and it is illogical in the extreme to suppose that, because the British type of voluntary hospital was based on gratuitous service by all concerned, that this more modern duty of medicine can be maintained on the same basis. In other words, if all classes of patients are to be admitted to our great hospitals, then the medical staff must be paid for their services. It is to the credit of the Americans that they have not only recognized the truth of this principle, but have had the courage to put it into practice, and in every one of the great university hospitals visited by me in Canada and the United States I found every member of the staff of both medical school and hospital was paid, and well paid, for their services.

His opinion, based on personal observation, is that under the new methods "the hospitals become self-supporting, and entirely free from that bureaucratic control feared by the more ardent supporters of the British voluntary system."

The problem before the Faculty of Medicine in Melbourne has been defined by Professor Berry in a letter published in the *British Medical Journal* of November 26th, 1927: "The Melbourne problem is, then, that which now everywhere confronts medicine: the seeking of the best combination of research, teaching, hospital, and laboratory in the cause of the national health—that is, the elimination of disease by study, research, and co-operative effort."—*Brit. M. J.*, 1: 700, April 13, 1929.

### POISON IVY

Green leaves are on the poison ivy again, and at least some outings are bound to have unhappy after-effects. Chemists and botanists, however, unite in declaring that there is no longer any need for susceptible individuals to suffer hours of itching agony from a luckless contact with the evil weed. There are several very

simple remedies, made of common, non-proprietary chemicals, that will banish ivy poisoning in almost 100 per cent of all cases.

A preventive recommended by Dr. James B. McNair, of the Field Museum of Natural History, Chicago, is a five per cent solution of ferric chloride in water, or in a mixture of water, alcohol and glycerin. This is to be washed on all exposed skin surfaces before going into the woods, and allowed to dry without wiping. The thin deposit of iron salt neutralizes the ivy poison immediately upon contact. This remedy has been in use by the botany classes of the University of Chicago for several years, with very good results.

For persons who have had the ill luck to become poisoned, Dr. James F. Couch, of the U. S. Department of Agriculture, recommends a wash of a three per cent solution of potassium permanganate. This oxidizes the poison, and healing follows rapidly. This remedy leaves the skin brown, but the stain may be removed with a one per cent solution of oxalic acid. Any of these remedies can be mixed by any druggist, without a prescription.

Poison ivy is really a misnomer, for the plant is not related to the common ivy. It is a sumac, and closely related to the even more vicious poison sumac that grows in our bogs. Poison ivy can be recognized easily by the three-parted leaves, which have given rise to the old saying: "Leaves three, let it be!" The plant may either climb trees by means of aerial roots that cling to the bark, or it may creep along just under the surface of the soil, sending up thickets of short, woody shrubs from a foot to three or four feet high. In this latter form the plant is sometimes called "poison oak," but that name is incorrect; it belongs by rights to a related shrub of the Pacific Coast.

Poison sumac troubles fewer persons than poison ivy, but those who are susceptible get hit harder. It is perhaps providential that this shrub grows only in acid-water bogs or on their borders, where only botanists or determined hikers venture. But where a road has been built through boggy country even automobilists will sometimes come to grief from it. It looks very much like ordinary sumac, but can be distinguished by its pale gray bark and its drooping clusters of white berries.

The "lacquer poisoning" with which some persons occasionally become afflicted is a form of ivy poisoning. Oriental lacquers are made from the gummy sap of a species of sumac that is related to the poisonous American species.—*Science*, May 24, 1929.

### TREATMENT OF IVY POISONING

In the event of coming in contact with poison ivy, endeavour to obtain some jewel weed, crush this and apply the juice to the part affected. This is one of the most reliable antidotes you can possibly get and the jewel weed is usually avail-

able as it grows in low, wet, marshy places, to a height of from two to four feet. It has a juicy-looking stem that is semi-translucent, and it is usually studded with orange-coloured hanging flowers, with brown spots on them. These flowers hang gracefully, and if you remember the combination of pale green juicy stem and a yellow or orange flower with brown spots, you can usually locate it without any difficulty.

If you are unable to get the jewel weed, you will very often find satisfactory results from using freely, strong laundry soap. We emphasize "laundry" soap, because it is necessary to have a soap containing an excess of alkali. In fact, fresh lime water, as you get it from your druggist, answers the purpose very well in many cases.—*Health Bulletin, Toronto, June 1, 1929.*

#### SCARLET FEVER

Much interesting work has been done in recent years in connection with the aetiology, diagnosis, prophylaxis and treatment of scarlet fever.

A variety of haemolytic streptococcus called *Streptococcus haemolyticus scarlatinae* appears to have better claims than any other organism to be the cause of scarlet fever, though the claims made on its behalf have not received universal recognition, rival views being held by various observers in Germany, Austria and Switzerland. Intradermal injection of the toxin of the *S. scarlatinae* is supposed to produce in susceptible subjects and also in the first few days of scarlet fever a reaction similar to the Schick reaction and known as the Dick reaction, and none in those who are not susceptible, including convalescents from scarlet fever, who possess an antitoxin capable of neutralizing the scarlet fever toxin. There is a fairly general agreement, however, that the Dick test is not quite so reliable a guide in scarlet fever as the Schick test is in diphtheria owing to the varying results yielded by the toxins of different strains of *S. scarlatinae*. As regards its diagnostic value my experience has been that it is too frequently negative in the first few days of the eruption and positive in convalescence to be of much assistance.

Another recent method to which considerable diagnostic value has been attached, especially by those whose clinical experience of scarlet fever is comparatively small, is the Schultz-Charlton or extinction phenomenon, which consists in blanching of the eruption when a small quantity (0.2 c.c.) of anti-scarlatinal serum is injected intradermally. I have but rarely derived any help from the use of this method, as I have found as a rule that the blanching is only well marked when there is no doubt as to the scarlatinal nature of the eruption and faecal condition, and even in such cases blanching does not always take place.

Recent work on the prophylaxis of scarlet fever has mainly been concerned with active immunization by scarlet fever toxin modified or

sodium ricinoleate which modifies the toxin without impairing its antigenic properties, or with passive immunization by scarlet fever antitoxic. During a recent epidemic in Poland, where the mortality in 1926 was as high as in London fifty years ago, i.e., about 13 per cent, Sparrow and Kaczynski actively immunized 15,000-odd children who were found by the Dick test to be susceptible to scarlet fever, with the result that the incidence of the disease was three times less among the inoculated than among the un-inoculated.

Active immunization with *S. scarlatinae* toxin has also been carried out on a large scale in the United States. Owing to the much lower degree of toxicity of scarlatinal as compared with diphtheria toxin, it is often used by itself without any counteracting antitoxin, but Larson and his collaborators, who found that sodium ricinoleate was an effective agent in detoxifying the toxin, have used a soap-toxin mixture which produced a rapid immunity without causing objectionable symptoms.

In the case of nurses active immunization against scarlet fever is not to be urged, as not only is the disease much less serious, but its incidence among them is naturally much lower than that of diphtheria. At my own hospital during the last three years, in spite of the absence of immunization, only 8 nurses have contracted scarlet fever, in each case of a mild character, as compared with 14 who developed diphtheria, most of whom had been given toxin-antitoxin.

In this country the chief work in active immunization against scarlet fever has been done in the cases of the nursing staff of the fever hospitals of Edinburgh, Manchester and Birmingham. At the Edinburgh City Hospital, e.g., Benson and Simpson found that by injection at intervals of five to fourteen days of gradually increasing doses of scarlet fever toxin it was possible to render the majority of Dick-positive reactors Dick-negative. If the dosage was carefully graded, immunization could be accomplished without any unpleasant reaction or permanent ill-effects. While, however, active immunity could be obtained by injection of relatively small doses of toxin, its duration in originally Dick-positive cases was only a few months, and if more lasting immunity was desired in Dick-positive reactors, much larger doses of toxin were required.

The intranasal route, as in active immunization against diphtheria, has been employed in a small number of cases recently by Ramon and Zoeller, who found that instillations of Dick toxin into each nostril made a positive Dick reaction negative.

Before leaving the subject of prophylaxis of scarlet fever a word may be said as to the method called after the late Dr. Robert Milne, Medical Officer to the Dr. Barnardo Homes. This method which consists of inunction of the skin with eucalyptus oil and application of 1.20 carbolic oil to the tonsils, has been definitely shown to be

valueless by Milne's successor, Dr. Gushue Taylor, as it does not prevent the spread of infection or the occurrence of complications and return cases.

Coming now to the treatment of scarlet fever, I may say that the use of a specific antitoxin in the disease forms one of the most interesting and valuable practical results of recent research. Owing to the mild character of the disease prevalent in London my experience of the remedy during the last three years has been rather limited, as I have not followed the example of some enthusiasts who recommend the use of antitoxin in every case of scarlet fever, as is the rule in the treatment of diphtheria. My practice has been to reserve the serum for cases of any degree of severity. Since March, 1926, I have had only 320 cases out of over 3,000 scarlet fever admissions which were given serum. These I have grouped in three classes—(A), (B) and (C), according to the effect of the serum. In Class A were 170 cases in which the benefit appeared to be immediate and well-marked. In Class B were 125 cases in which the benefit though definite was less rapid and pronounced, and in Class C were 25 cases which derived no benefit from the serum and the deaths numbered 6.

A serum rash, usually urticarial in character, occurred in 74 cases (23.1 per cent), but in only ten there was any pyrexia with some constitutional disturbance, and sometimes there was secondary adenitis and pains in the joints such as are met with in serum sickness due to other sera. Since the employment of refined serum, however, the incidence and severity of serum sickness have been greatly reduced.

I have been much impressed by the action of serum in septic cases in which the tendency to ulceration of the throat is apparently checked by this means. There is also often a striking improvement in the general condition, though the temperature does not always fall by crisis to normal.

In scarlet fever of any severity it is even more important than in diphtheria that the serum should be given early, as in late cases, contrary to what I have emphasized in diphtheria, it appears to have little if any effect, and my experience like that of the majority of other observers has been that it does not prevent the occurrence of complications.—(J. D. ROLLESTON, M.A., M.D., M.R.C.P., Medical Superintendent, Western Fever Hospital, London, in the *Post-Graduate M. J.*, 4; 159, June, 1929)

#### THE COCKTAIL HABIT IN FRANCE

In the *British Medical Journal* of January 9th, 1929, page 31, was noted Professor W. E. Dixon's warning about the injurious effects of cocktail addiction; recently a similar denunciation has been made at the Académie de Médecine by Professor Georges Guillain, who occupies the chair of nervous diseases in the Paris Faculty of

Medicine. Before the war, he states, this practice, imported from America, had been confined to certain sections of French society, particularly racing, literary, and dramatic circles, but lately it has become prevalent among the well-to-do classes generally. The cocktail bar is to be found not only in hotels and restaurants, but even in the homes of the rich. Furnishing firms make it their business to supply more or less elegant bars suitable for drawing rooms, even for motor cars, while special hampers containing the ingredients and utensils used in the preparation of cocktails are on sale everywhere. As in this country, the principal victims of the habit are young men and women of the "smart" set, and among them Professor Guillain has often found obvious signs of chronic alcoholism. Commonly met with are digestive disturbances, manifested as loss of appetite, hyperchlorhydria, pyloric spasm, congestion of the liver, and enteritis, and such circulatory symptoms as tachycardia, precordial pain, and a tendency to syncope. The most important disorders, however, are referable to the nervous system, and include insomnia, physical and psychical asthenia, depression, and disinclination for mental work. In several instances epileptic attacks, attributed to the cocktail habit, have occurred for the first time in individuals of 25 to 35 years of age. Professor Guillain urges that young people of the wealthy classes should be enlightened as to the disastrous effects of cocktail drinking, both on their own physical and mental equilibrium and on that of their descendants.

#### SPIROCHÆTAL EMPYEMA

At a meeting of the Section of Pathology of the Royal Academy of Medicine in Ireland in the Royal College of Physicians, on April 19th, with the president, Dr. T. T. O'Farrell, in the chair, Dr. J. McGrath showed a patient with spirochaetal empyema.

A farmer, robust in appearance, was admitted to St. Vincent's Hospital on February 8th. He gave a history of "never being sick in his life" until he felt ill on December 23, 1928, when his local medical attendant sent him to bed for several days, telling him that he was suffering from influenza. He was out and about again after Christmas, but grew progressively weaker as time went on. On his admission to hospital the temperature was 101° F., the pulse 80, and the respirations 20 per minute. There were no physical signs indicative of chest or other trouble; the urine had a slight trace of albumin, but the sediment contained no pus, blood, or casts. For the succeeding few days his temperature was normal, but at the end of a week it was 99.5° F. in the evening for four days. After February 17th, when he was operated on, the temperature remained continuously normal, the pulse 72, and respirations 20. On February

16th there was slight dullness at the base of the left lung; it was needled and a small amount of brownish red pus was withdrawn. This pus contained many cells and moderately numerous spirochaetes. No other organisms were seen in the smear preparations, and on culture no growth appeared either aerobically or anaerobically. The spirochaetes found were then non-motile and stained easily, being Gram-negative; they were  $4\mu$  to  $10\mu$  long, rather thick, and with two to eight undulations. They resembled *S. refringens*, but several of them appeared too short and too regularly curved to be this spirochaete. A blood count on February 17th showed red cells 4,120,000 per c.mm. (82 per cent), haemoglobin 55 per cent, colour index 0.7, white cells 15,680 per c.mm. The red cells showed very slight anisocytosis, and of the white cells 79 per cent were polymorphonuclear leucocytes, and 1 per cent were eosinophils. Tubercle bacilli could not be found in the sputum, nor could spirochaetes (which are sometimes to be found in large numbers in bronchiectasis); the Wassermann reaction was negative. On February 17th two ribs were resected, and several pints of tomato-soup-like fluid were evacuated; this fluid gave similar results to the small specimen first examined. A drain was left in. The pleural cavity was still draining, but on April 12th the fluid showed no spirochaetes, and produced a growth of pneumococci and a coliform organism. The patient was given injections of novarsenobenzol, and a vaccine had been prepared from the last cultures of the fluid. The urine, on April 17th, contained a considerable amount of albumin, several hyaline and some granular casts; but the patient's condition appeared to be good.

Dr. McGrath said that few cases of spirochaetal empyema appeared to be recorded, especially where not associated with gangrene of the lung and without other organisms. A case with spirochaetes in an empyema but with gangrene of the lung had been recorded by some French observers in May, 1928, but Dr. McGrath had been unable to obtain the original paper. In the present case he was assured that there was no suggestion of gangrene of the lung. The patient's teeth were in good condition, but showed one small and one moderately large cavity. In view of the fact that it had been stated that in cases of tropical broncho-pulmonary spirochaetosis the *S. castellanii* could nearly always be isolated from bad teeth, smear preparations of scrapings from the patient's teeth cavities were examined. There were very numerous micro-organisms present, but spirochaetes could not be found.

The President said he had never seen a similar condition to that shown by Dr. McGrath. He thought at first that the spirochaete might have come from a cavity in the lung, but understood

that clinicians who had seen the case said that this was not so. Professor J. W. Bigger stated that spirochaetes were found in gangrenous conditions, but nearly always in association with other organisms. It was rare to find them confined to the pleural cavity. Professor Beattie drew attention to the large number of spirochaetes present, and their thickness, and thought that they might possibly have come from the teeth, but apparently this was not the cause.—*Brit. M. J.* 1: 957, May 25, 1929.

#### YEAST AND PUFFERY

Under the title of this comment, the *British Medical Journal* a few weeks ago called attention to some "highly objectionable advertisements of a proprietary brand of yeast" that were appearing in American and Canadian periodicals that circulated also in the British Isles. These advertisements, according to our British contemporary, were of the testimonial type and purported to be signed by European or American medical men. While not mentioned by name, it seems quite obvious that the *British Medical Journal* referred to the blatant series of advertisements that the "Fleischmann's Yeast" concern has been running recently. As the result of the editorial comment, a well known London physician has written to the *British Medical Journal* and briefly recounted his experience in this field. To quote:

"On April 3rd of last year my secretary made an appointment for me to see a Miss E. She duly appeared, not, however, in the guise of a patient, but in that of an advertising agent for a well known brand of yeast. Her proposition to me, made most charmingly, but in the best American business manner, was that I should write a testimonial extolling the virtues of yeast, this testimonial, together with my name and photograph, to appear in magazines, newspapers, and (or) in other advertising media published in the United States of America and Canada. For doing this I was to receive the sum of £150 (\$750). To quiet any scruples I might have against so doing, I was informed that four members of my profession in London had already signed the agreement, a copy of which is here appended."

The physician added that, while showing the advertising agent to the door, he suggested that there were other things in life that he valued more than one hundred and fifty pounds! In this connection, our readers may be interested in the following incomplete list of European and American physicians whose names (and pictures) have been used by the Fleischmann people in their recent advertising campaign. Of English physicians, we find the following four, described as quoted:

"Dr. Leonard Williams, prominent physician," London.

"Sir W. Arbuthnot Lane, Bart., C.B., England's great surgeon."

"Dr. L. F. Roebuck Knuthsen, O.B.S., eminent British skin specialist."

"Sir Bruce Bruce-Porter, K.B.E., C.M.G., one of the best known English physicians." From France there are given:

"Dr. Clemont Simon, skin specialist," Paris.

"Dr. Georges Caussade, Laureate, Faculty of Medicine," Paris.

"Dr. Georges Rosenthal. . . . Paris."

"Dr. Victor Pauchet, eminent Paris surgeon."

"Dr. Gaston Lyon, one of the outstanding figures of the medical profession in France." From Germany and Austria:

"Prof. Dr. Adolf Cluss, international authority on nutrition."

"Prof. Dr. Paul Reyher, lecturer, University of Berlin, on vitamins, X-Ray and Pediatrics."

"Prof. Dr. Carl Neuberg, Lecturer University of Berlin."

"Dr. Laszlo Berezeller, a leading Austrian nutrition expert."

"Dr. Kurt Henius, famous lecturer at University of Berlin."

"Dr. Viktor Grafe, Vienna's official food expert."

While last, but not least, expert testimony from America comes from:

"Dean H. H. Rusby, M.D., Professor of Physiology, College of Pharmacy, Columbia University, says in his forthcoming book. . . ."

"Dr. George Parrish, well known Health Officer of Los Angeles."

"Dr. Ira L. Hill, prominent New York physician and abdominal surgeon."

Whether any, or all, of these physicians received £150 or its equivalent in francs, marks, crowns or dollars, we do not know. From those who did not, we shall, in the words of our British contemporary, be pleased to have "the opportunity of publishing their disclaimer."—*J. Am. M. Ass.* 92: 2025, June 15, 1929.

## Special Correspondence

### *The London Letter*

(From our own correspondent)

**The Labour Government and the Profession.**—Parliament has begun its session with a Labour Government in office and the medical profession is represented by about as many members as before, scattered on both sides of the house. It is interesting to speculate to what extent socialism will be applied to the organization of the health services of the nation for already the Ministry of Health, the Insurance Act and all the various municipal health activities would be viewed as frankly socialistic schemes by citizens of fifty years ago. In two directions there appears to be some urgent need for "state interference": one concerns the training of nurses. At the present time the nurse comes to hospital partly to nurse the sick but mostly to learn her art and the educating of the nurse is forming an increasingly important part of every hospital's duties. At the same time as she has to study hard to take the examinations supervised by the state she has to work very long hours at wages which no trade union would look at for a moment. The standard of preliminary education has now been raised so that only a well-educated girl can gain admission to many of the large hospitals and yet she has to spend an undue proportion of her time cleaning, washing-up, fetching and carrying, all of which could very well be done by less well-educated em-

ployees, only the hospital would have to pay much more for such labour than the nurse receives. At the same time the senior nurses and sisters have so much administrative work to do and so much direct responsibility to the medical staff that they have little time for carrying out that teaching at the bedside which is so essential for learning the art of nursing. Such is the present situation and perhaps a Labour Minister of Health may see fit to tackle the problem. The second direction in which the state may well take early action concerns the cripple. From the days when cripples were regarded with fear and repugnance we have moved a long way but it is still too prevalent a view that cripples must be treated in charitable institutions and homes as burdens upon the community. In a paper read earlier this year before the Medical Officers of Schools Association that great authority Sir Harry Gauvain outlined a bold national policy whereby he estimates it should be possible to prevent 70 to 90 per cent of the amount of disability at present occurring. Alongside of such a policy of prevention he pleaded for an extension of the hospital school principle so that the crippled child's mind can be adequately trained and the patient satisfactorily fitted to enter the world again when a cure has been effected. The Board of Education already helps by grants but what is required is pressure upon such areas as do not at present make provision for the physically defective child.

*Anti-anti-vivisection.* — Two meetings concerned with the subject of vivisection have recently been held and both ended in considerable turmoil. The British Union for the Abolition of Vivisection attempted to hold a meeting at the Caxton Hall last month but it ended with the entrance of the police to arrest interrupters, while Professor A. V. Hill's third Stephen Paget Memorial Lecture also ended in "considerable turmoil." Professor Hill took a very high idealistic line in his address entitled "Enemies of Knowledge." Instead of maintaining that vivisection is useful or that it is necessary he held that it is a means of finding out things that could not be discovered by any other method. In other words any attempt to hinder the advance of knowledge for its own sake cannot be too emphatically condemned by the true scientist. Incidentally Professor Hill was moved to indignation by some of the tactics of the anti-vivisectionists and he especially mentioned the case of a parish priest of a well known London suburb who urged his flock in his parish magazine not to support a Government at the last election which spent £148,000 last year on the work of the Medical Research Council. To anyone who has even the slightest knowledge of the magnificent way in which this money, actually the surplus raised by the Insurance Acts, is used, such a plea is entirely unwarrantable and it is right that the attention of a wider audience should be drawn to such interference, in the name of religion, with the pursuit of knowledge.

*Keeping London Clean.* — It costs over two million pounds each year to keep this great city clean and the methods whereby this vast sum is expended by all sorts of municipal authorities are not, to say the least, economic or logical. Parts of the public cleansing system are admirable, the network of great sewers is probably a triumph of engineering, but on the other hand stinking rubbish heaps on the lower reaches of the Thames are a crying disgrace. A recent report issued by the Ministry of Health is frankly a revelation of sanitary failure and it is strongly urged that some central body be created for co-ordinating all the work of the local sanitary authorities. The problems revealed by this report are not so much medical as governmental but the profession is entitled to be alarmed when the Ministry's investigator describes refuse dumps as "reeking masses" and refers to "rat infestation" and "fly-feeding belts" in a district quite close to human habitations. London must obviously take its sanitation in hand in the near future.

ALAN MONCRIEFF.

London, July, 1929.

### The Edinburgh Letter

(From our own correspondent)

On May 15th, His Royal Highness Prince George opened the new Department of Zoology which has been erected by the University of Edinburgh on the south side of the city. This is the second of what are called "The King's Buildings." His Majesty the King laid the foundation stone of the first of these, the Chemistry Department, nine years ago. A third building is in the course of construction for the Animal Breeding Research Department. The new Zoology Building cost £80,000. The Professorship of what used to be called Natural History dates from 1770. More than fifty years ago the Professor was Wyville Thomson, famous as the leader of the "Challenger" Expedition, which carried out a world-tour of scientific investigation. After him came Professor Cossar Ewart who was head of the Department for forty-five years. There many thousands of students gained their training in zoological science, including some who are now the heads of important schools, such as Professor J. P. Hill, F.R.S., of University College, London; Professor Cole, F.R.S., of Reading; and Professor Greig Wilson of Belfast. Professor Ewart played an important part in laying the foundations of that section of zoological science known as Genetics, which in Edinburgh University forms the subject of a special Chair. The Zoology Department in its new home will be under the direction of Professor Ashworth. After the opening ceremony had been performed the honorary degree of Doctor of Laws was bestowed upon Prince George.

Among other ceremonies arranged to honour the Principal of the University on his retirement, a torch-light procession was held last March. The procession consisted of twenty decorated lorries and several hundred gaily dressed students. It wended its way through the principal streets of the city and stopped before Sir Alfred Ewing's house in Moray Place. From the balcony the Principal addressed the students who indicated their affection for him and their regret at his resignation.

The Annual Exhibition of the Royal Scottish Academy was adorned by at least two portraits of Academic interest. The first, of the Principal of the University, Sir Alfred Ewing is by Mr. Henry Lintott, R.S.A. This was presented on the 11th of June in the Upper Library Hall. The second is a portrait of Sir Leslie MacKenzie, by Mr. Henry Kerr, R.S.A. This was presented to him by the Scottish branch of the Society of Medical Officers of Health and the Scottish Society of School Medical Officers, on the occasion of his retirement from the Board of Health.

Sir Robert Philip, the Professor of Tuberculosis, has received the degree of Doctor of Medicine *honoris causa* from the University of Egypt.

Professor Sidney Smith has been awarded the Swiney Prize for 1929. The award is adjudicated by the Royal Society of Arts and the Royal College of Physicians of London. The Prize, which consists of £100 and a silver cup, is the gift of the late Dr. Swiney, who died in 1844, leaving a sum of money to provide for a quinquennial award for the best published work on jurisprudence.

Sir Norman Walker was the lecturer at the third Malcolm Morris Memorial Lecture, arranged by the Chadwick Trustees at the Royal Society of Arts, London. Sir Norman chose as his subject "The progress of dermatology over fifty years." He described the conditions in Edinburgh in 1880, when there were no skin wards in the then new Royal Infirmary, and after dealing with the progress of dermatology, struck a note of warning regarding certain forms of light treatment. He counselled the younger generation not to neglect altogether the old remedies and the principles which lie behind their use.

The Morison Lectures, before the Royal College of Physicians of Edinburgh, were given by Dr. R. Dods Brown, of the Aberdeen Royal Asylum, on the 3rd, 5th and 7th of June. Their title was "Some observations on the treatment of mental disease."

The annual golf match between the Royal Colleges of Physicians and Surgeons took place at New Luffness Golf Club, on May 20th. The College of Surgeons won by 17 games to 6.

The Harveian Festival was held on May 31st, in the Royal College of Physicians. Dr. Lewis C. Bruce, President of the Harveian Society, presided over a gathering of more than a hundred, which figure constitutes a record. The President chose as the theme for the Oration "Life and customs in the time of William

Harvey." After an interesting and inspiring address the society and its guests dined in the hall of the College.

The death of the veteran Liberal statesman Lord Rosebery recalls the fact that one of his ancestors, Gilbert Prymoss was the first Deacon of the "Craft of Chirurgeons," which in 1583 was granted pre-eminence amongst the Trade Guilds of Edinburgh. This was the same body as the Corporation of the Surgeons and Barbers, whose original seal of cause was granted in 1505, eight years before the battle of Flodden, and which we now know as the Royal College of Surgeons of Edinburgh. In 1558, three years before the return of Queen Mary to Scotland, Gilbert Prymoss was one of twenty-five apprentices who were sent by the Incorporation to join a corps raised for the defence of Edinburgh against "our auld inemyes of Ingland." He became surgeon to James VI and accompanied the King when he went south to assume the Crown of England. He died at Westminster in 1616 at the age of 80. Dr. Peter Lowe, the founder of the Faculty of Physicians and Surgeons, Glasgow, was a friend of his, and inscribed his treatise on Chirurgery to him and to James Harvey, another Fellow of the Craft of Surgeons. One of the possessions of the late Earl of Rosebery was a brass mortar and pestle bearing the name of Gilbert Prymos. A replica of this is preserved in the Museum of the Royal College of Surgeons. The connection with the family of Primrose was carefully maintained as the late Earl was an Honorary Fellow. At the Quadracentenary of the foundation of the College in 1905, the Earl of Rosebery was the guest of honour and gave one of his most eloquent addresses at a banquet given to celebrate the occasion. A grandson of Gilbert Prymoss was created a baronet of Nova Scotia by Charles I in 1651.

GEORGE GIBSON.  
23 Cluny Terrace, Edinburgh.

Harry Gold and Arthur C. DeGraff in making studies on digitalis in ambulatory cardiac patients found that regarding the use of digitalis it is essential to bear in mind the practical distinction between (1) types of failing circulation in which the use of the drug results in striking improvement, and (2) types of failing circulation in which the use of digitalis is indicated on the basis of certain experimental data and theoretical considerations, but in which clinical study thus far gives evidence of little, if any, beneficial effect. It is pointed out that numerous errors in the interpretation of clinical observations have arisen from failure to consider this distinction. There is no essential difference between the behaviour of digitalis in children and in adults. The drug is less often seen to produce striking improvement

in children than in adults because the type of heart failure that is relieved most effectively by digitalis (congestive heart failure without active infection of the heart) is relatively common in heart disease among adults but relatively rare in that among children. In those cases in which less definite therapeutic effects are obtained, insufficient or excessive digitalization is more apt to occur because of the absence of a satisfactory guide to the intensity of digitalis action. Digitalis cumulation, as occurring in the course of the daily administration of a suitable fixed dose of the drug, can be shown to be a self-limiting process. The intensity of digitalis action present at the time when further cumulation ceases to occur depends on the size of the daily dose.—*J. Am. M. Ass.*, 1929.

## Letters to the Editor

*To the Editor:*

Much is being said and written in all parts of our country to-day on the question of state medicine. In some parts of Canada this is not only talked and written of but is practised to some degree.

There is a cry going up from the public, upon whom we depend for our living, (at least those of us who are in private practice), that medical and surgical fees are too high: that the cost of being ill is becoming out of reach entirely of the middle class. What will the outcome of all this be? Does anyone attempt a guess at this time? Older men than I have answered in different ways when the question has been put to them. Some will say that they think state medicine will be here in twenty-five years, others say that it will never come. Yet what are our medical schools doing to help solve this problem? What about a department of medical economics in our medical schools? The professor of medicine in one of our leading medical schools, when the suggestion was made to him said, "That is most impracticable." But is it?

How many of our young graduates know anything about the following problems that they will meet with when they get their parchment. The selection of a practice. Buying a practice. Starting a new practice. Purchase of equipment for practice. Records in practice, including business records. Investments outside of practice. Methods of collection, and a dozen other little things?

And some of the older practitioners will say, "Why should we worry about the young fellow starting out?" The answer is: because the medical profession generally need the lessons of the older practitioner's economic faults.

Why it is not possible to have such a course as this established? Leading men from the towns, the cities, general practice, specialist practice, industrial practice, might be asked to come and give to the graduating classes something of their problems when they set sail. A prominent financier might be asked to tell the final year about investments and speculation. Every stock salesman calls on the medical men first when he hits a new town.

Mr. Editor, all of this may seem utterly ridiculous to many, but there are nation-wide problems which such a department might help to solve as well as the individual problems of the average medical man who cannot afford a paid bookkeeper or an efficiency expert. We might raise the status of our entire calling from that of being the last to be paid to that of being first. Then, when everyone pays, the cost of being ill will certainly fall and every patient will have an opportunity of getting decent medical and surgical treatment at a reasonable rate.

Yours very truly,

"The Country Doctor."

June 24, 1929.

## Abstracts from Current Literature

### MEDICINE

**Chronic Appendicitis.** Deaver, J. B., *Am. J. Med. Sci.* 177: 749, June, 1929.

Dr. Deaver takes issue squarely with those who say that chronic appendicitis is not a clinical entity. It is important that erroneous views on this matter be not allowed to pass current, inasmuch as such will cost human lives. Chronic appendicitis is as much an entity as chronic peptic ulcer or chronic cholecystitis.

Chronic appendicitis cannot always be diagnosed by means of the x-ray, for pathological change may so obstruct the lumen of the appendix that bismuth or barium cannot enter therein.

Chronic appendicitis may result from a previous acute attack, but may also be traced sometimes to a low grade intestinal infection.

Chronic appendicitis, the result of previous

acute attacks, is followed by intermittent attacks of slight pain, epigastric distress, occasional nausea, and more or less gaseous distension, particularly of the small bowel, a syndrome that at times is impossible to differentiate from a mild chronic cholecystitis, a typical duodenal ulcer, or a slight chronic pancreatitis. Palpation elicits rigidity of the overlying abdominal muscles, tenderness, and often, also, reveals an enlarged appendix.

In the second form, the symptoms come on insidiously, with indigestion, slight abdominal discomfort, and mild intestinal distension. Violent exercise, or fatigue, causes discomfort in the right lower abdomen, and, not infrequently, pain. Here skilful palpation will reveal characteristic findings; more or less loss of flexibility of the overlying abdominal muscles, tenderness, and, often, a palpable appendix.

The conditions most often confused with

chronic appendicitis are: chronic peptic ulcer, chronic cholecystitis, a mobile splashing and tender cæcum, with or without coloptosis or visceroptosis, stone in the right ureter, carcinoma of the cæcum, tuberculosis of the cæcum, tuberculosis of the peritoneum, tuberculosis of the ileo-cæcal lymph-node, diverticulosis, chronic diverticulitis, retroperitoneal lymphangitis, effusion into the sheath of the psoas muscle, early psoas abscess, chronic right-sided pyelitis, stricture of the right ureter, and a chronic lesion of the right uterine appendages. The most commonly met with of these conditions are, carcinoma and tuberculosis of the cæcum, pyelitis, and chronic disease of the right uterine appendages.

That the chronically diseased appendix is a menace is evidenced by the fact that it is found to be affected in practically all cases of abdominal disorders, such as chronic cholecystitis and chronic peptic ulcer, so that it must be a factor in the etiology of these conditions. In all abdominal infections the appendix is the most common site of the trouble.

The fact that all patients who are operated upon for chronic appendicitis are not relieved of all their symptoms does not prove that there is no such entity. The appendix is the most important source of focal infection, as is borne out by the experience of surgeons, who find upper abdominal inflammation and appendiceal inflammation associated together in practically every case.

A. G. NICHOLLS

#### **Penetration of Ultra-Violet Rays Through Fabrics.** Latzke, A., *Am. J. Hygiene* 9: 629, May, 1929.

But little work has been done with fabrics in regard to their penetration by ultra-violet rays. The author has carried out a series of experiments designed to determine the protective action of certain black or white fabrics for bacteria, when light rays are allowed to penetrate the fabrics, and when the rays exerted their action on fabrics inoculated with bacteria. A comparison was also made between certain cotton, linen, woollen, and silk materials as far as the nature of the fibre and its colouring influenced the germicidal action of light. The bactericidal action of light is confined to the ultra-violet region of the spectrum, beginning at  $3g0 \mu$  and extending with increasing intensity to the shortest measurable wave-lengths ( $185 \mu$ ).

Some of the author's more important conclusions are the following.

A ten-minute exposure to ultra-violet rays is more effective in its germicidal action upon organisms on white cotton, linen, and silk fabric than on woollen fabrics having a similar per cent interspace.

Ultra-violet light has a less prolonged germicidal action upon organisms exposed on black

material than on white, though more tests must be made before conclusions should be drawn as to the relations between fabrics.

When the fabric is used merely as a screen for light rays, and the time of exposure is uniform, black offers more protection for bacteria than white material of similar interspace.

Light seems to have more germicidal power when transmitted through linen and silk materials than through those composed of cotton or wool.

The size of interspace of the fabric appears to be of more importance in permitting the germicidal action of ultra-violet light than is colour.

A. G. NICHOLLS

#### **SURGERY**

##### **The Prevention of Peritoneal Adhesions.** Gellhorn, G., *Surg., Gyn. & Obst.* 47: 817, June, 1929.

Dr. Gellhorn cannot unreservedly accept the view that it is impossible to prevent peritoneal adhesions after laparotomy. He admits that there are patients whose peritoneum is abnormally sensitive, and there are the cases in which infection makes adhesions a certainty. But putting these aside, he thinks that in the majority of these operations there is something wrong with the technique which allows the formation of adhesions.

Many remedies have been advocated, and continue to be evolved, but we should not expect too much of any one procedure. The best and soundest method is to take precautions throughout the entire operation. Some of the common slips in operative technique are mentioned: for example, the gloved hand should not be introduced into the abdominal cavity without being first rinsed in saline, as otherwise it will carry in irritating chemical substances, such as picric acid, iodine, or other skin disinfectants. The same possibility is to be kept in mind when loops of bowel are allowed to escape and lie on the abdominal skin. The unprotected pressure of retractors leads to mechanical irritation of the peritoneum. Energetic sponging of the abdominal cavity, or even sudden or forcible flooding with saline solution, may lead to damage. Closure of the peritoneum should always be done with broad adaptation of the cut edges and eversion.

These are mistakes which are frequently made; but which can be easily avoided with care. Further suggestions are made. The walling off of intestines should always be done with wet, warm materials. Gauze or towels have the disadvantage of irritating the peritoneum and tending to cool it by evaporation. Dr. Gellhorn uses sheets of pure rubber, which are kept in warm saline solution till needed. These are smooth, are easily boiled, and do not

irritate the gut. The giving of a large enema at the close of the operation sometimes is useful in straightening out the kinks of intestines and preventing them from adhering. If this distension of the gut forces the intestines and omentum against the anterior abdominal wall too much, air or oxygen may be pumped in to separate them.

Finally, details are given of the author's method of covering raw surfaces upon the fundus with peritoneum.

H. E. MACDERMOT

**Tumours of the Salivary Glands.** Wakeley, C. P. G., *Surg., Gyn. & Obst.* 48: May, 1929.

Angiomatosis is rare. It occurs mostly in children, but if present in adults is congenital. The tumour tends to increase in size and is more or less circumscribed. The skin over it is purplish in colour and no definite capsule is present. On removal the tumour is lobulated and resembles fat, with many tortuous and dilated vessels running in every direction. The glandular structure is replaced by a network of capillaries possessing a single layer of endothelium.

Adenomata are rare. They occur most frequently in the parotid and are always encapsulated. They may be cystic or solid. Adenomata are alveolar in structure, reproducing the acini of the gland. They tend to become malignant.

Mixed tumours are also known as embryomata, or endotheliomata. They are commonest in the parotid. Spaces containing material resembling cartilage are characteristic. This material is formed by a change in the mucin of the tumour, resulting in a loss of its fibrillar appearance. At present the consensus of opinion is that these tumours are entirely epithelial in origin. Mixed tumours are equally present in each sex. There is no age incidence. They are usually in the superficial portion of the gland, are freely movable, and are coarsely nodular. They vary in consistency. The facial nerve is not involved unless malignant change is present. A definite capsule is present. A parotid fistula rarely follows excision. A definite tendency to recur is shown even after a long interval. Twenty per cent of 35 cases analyzed recurred. Surgery followed by radium is advised by Burrows. Radium tubes may be left in the cavity after operation. Mixed tumours are of slow growth. Rapid increase in size and involvement of the facial nerve may send the patient to the doctor. These signs are usually due to malignancy. Fifty-two cases are reported and twelve of these showed malignant change. The average age of these twelve was fifty-eight. The average length of life after facial nerve involvement was sixteen months. Of the mixed

tumour group five were dead in ten years of malignant disease of the parotid. Twenty-three cases showed no recurrence. X-ray or radium does not increase the length of life in malignancy of the parotid. Mixed tumours should be considered as potentially malignant.

R. V. B. SINGER

**Perinephritic Abscess.** Peacock, A. H., *Surg., Gyn. & Obst.* 48: June, 1929.

Perinephritic abscess may be renal or extra-renal in origin. The former is a metastatic haematogenous infection; the latter is associated with infections of the upper urinary tract.

Extrahepatic abscesses rarely show renal symptoms, or positive urinary findings. Tuberculosis seems to be a factor in many cases. The incubation period in one series was two to six weeks. Post-partum infection is responsible for some extrahepatic abscesses. Infection is apparently due to extension to perirenal lymphatics. *Staphylococcus aureus* was found in fifteen out of nineteen cases. Renal abscesses develop by direct extension. They form beneath the capsule and usually on posterior surface. Secondary lung abscesses may develop following perforation of the diaphragm by renal abscess.

The age incidence varies from eight to sixty-three years. The average age for both types is 32.5 years. Perinephritic abscesses are more frequent in males.

All cases show fever. A preliminary mild chill, rise of temperature to 103° or 104° followed by sharp decline and sweating is the usual daily course. Progressive weakness is evidenced. Nausea and occasionally vomiting is present. A severe, unilateral, practically constant, throbbing ache in the costo-muscular angle is a localizing symptom. The pain is usually worse on walking. Spasm and partial fixation of the psoas and erector spinal muscles result from irritations. Rigidity of the spine or a temporary lordosis may result. Swelling is seen in many cases. It is evidenced by having the patient lie straight on a hard, flat bed. Scoliosis may be shown by this position also. The average white blood count is 20,000. Extrarenal abscesses may cause a painless frequency. Pyuria may be a secondary infection of the urinary tract. Haematuria is frequently present in renal abscesses. Symptoms in the renal type may develop over a period of two years; in the extrarenal, from nine days to six weeks.

Diagnosis is often difficult. Deep position, the protection of the renal fossa, and the lack of urinary symptoms account for this. Urinary findings are of no aid. In children it is frequently mistaken for tuberculosis of hip or spine. Freedom from pain on movement frees

these areas from suspicion. X-ray is of little value. Disappearance of the line of the psoas, obscuring of the transverse process, and poor kidney outline may be due to flatus. Lateral curvature of the spine is of most importance. Stereoscopic plates should always be taken. These will show displacement of the kidney, pelvis and ureter, if the abscess is of any size. These are pushed anteriorly and occasionally laterally.

R. V. B. SHIER

**Beitrag zur Cholecystographie mit einer neuen internen Method. (Contribution to cholecystography by means of a new internal method.)** Hoffmann, K., *Münchn. med. Wochenschr.* 76: 629, April 12, 1929.

The author is of the opinion that both the intravenous and oral methods of administering the "contrast-substance," commonly in use, for purposes of cholecystography leave much to be desired. He has, with the idea of developing a better technique, investigated the method suggested by Sandström, in which the drug usually employed is suspended in a contrast emulsion. This is accomplished by the addition of soda water to sodium tetraiodophenolphthalein. If an acid is added to this emulsion an anhydride, that is, tetraiodoxyphthalphenon, is formed, which substance is better borne by the stomach. When it comes in contact with the alkaline content of the bowel it is reconverted into the sodium salt. The firm of Merck has put out a preparation, produced in this way (Oraltetragnost), which can be made up simply with tap water. This preparation has now been tried out on a considerable number of patients, with satisfactory results.

A. G. NICHOLLS

## GYNÆCOLOGY

**Ovarian Irradiation and the Health of the Subsequent Child.** Murphy, D. P., *Surg., Gyn. & Obst.* 48: 766, June 1929.

This, with a previous publication on the literature of the subject, purports to be the largest collection of reported cases in connection with the possible relationship between irradiation of the maternal pelvis and the health of the subsequent children. It is admitted that in trying to estimate the part played by irradiation of the mother in influencing the health of the child, other factors are concerned which complicate the question very greatly. Some of these factors are as follows:

(1) What is meant by the term "unhealthy child"? (2) Nothing is known of the hereditary or environmental influences at work either upon the mother or the unborn child. (3) We are ignorant of the effect of systemic or pelvic local disease on the growth of the fetus. (4)

The children of the irradiated mothers do not show any structural or functional disturbances that are not found among children whose mothers have not been irradiated. Irradiation cannot be said, therefore, to produce any defects peculiar to itself. (5) There is great difficulty in determining the frequency of physical deformities amongst children whose mothers have received no irradiation, that is, amongst the mass of the population.

These are some of the reasons which make the conclusions of this study general rather than specific. In spite of this, however, certain interesting conclusions are possible. For instance, it may be stated with certainty that about 16 per cent of the full-term children of irradiated mothers were known to be *unhealthy* at some time while under observation. This is not considered as an excessive morbidity percentage, and it is believed therefore that irradiation of the mother has no injurious effect on the health of the children.

It is evident, however, that the time at which the irradiation is given is an important factor. This is brought out by the fact that the higher proportion of the more serious disturbances fell into one group which included those mothers who had been irradiated *after* conception had taken place. Furthermore, the deformities of the children whose mothers were irradiated during pregnancy seemed to conform to a type, which was not the case with those in whom the treatment was given before conception. It is concluded that post-conception irradiation should not be given during pregnancy if the fetus is to be allowed to go to term, for there is a 40 per cent likelihood that the child will present some serious defect as a result. This opinion has not been held in the past, as is indicated by the fact that in a number of cases irradiation of the pelvis in pregnancy has been employed in the treatment of uterine carcinoma complicating pregnancy. Irradiation, therefore should not be given before ascertaining if pregnancy exists.

H. E. MACDERMOT

## PÆDIATRICS

**Chronic Bronchiectasis in Childhood, with Observations on early Diagnosis.** Thorpe, E. S., *Am. J. M. Sc.* 177: 759, June 1929.

The author reports and analyzes a series of 53 cases of bronchiectasis in children under thirteen years of age. The opinion is advanced that the condition is far more common than has been supposed.

The usual antecedent factors in the etiology of the condition are: bronchopneumonia, whooping-cough, and measles, since they carry infection deep into the framework of the bronchi and lungs. Infection of the accessory

sinuses, also, may contribute by maintaining a state of sepsis.

The disease is a serious one, as it gravely hampers the nutrition of the sufferers.

It is important that the diagnosis be made early. Treatment should be based on rational principles. Expectancy, or the routine prescription of cough mixtures, is to be deprecated. Treatment, to be effective, must be bronchoscopic, and between treatments the children should have postural drainage, breathing exercises, plenty of nourishing food, cod liver oil, fresh air, and adequate heliotherapy.

A. G. NICHOLLS

**The Demonstration of Tubercle Bacilli in Small Children with Pulmonary Tuberculosis.** Poulsen, V., Jensen, K. A., and Husted, E., *Am. J. Dis. Child.* 37: 5, 1929.

After commenting upon their unsuccessful attempts to recover tubercle bacilli from material obtained from the throat by the cotton swab method, the Copenhagen workers report their results in demonstrating the organism in the stomach contents of infants and small children by a modification of Meunier's method.

Their procedure was as follows: The stomach, after a fast of at least six hours, was washed with half a pint of sterile water, the return fluid was centrifugalized, the sediment homogenized and stained by the Ziehl-Neelsen method. Cultures from the sediment were made on Petroff's medium, and guinea-pigs were inoculated with the sediment.

Fifteen cases are reported in detail. The first group comprised six children (five of them under ten months of age) in all of whom the diagnosis of pulmonary tuberculosis was regarded as certain. Microscopic examination of stomach contents showed tubercle bacilli in four cases; culture on Petroff's medium produced a growth of the organism in all six cases; and guinea-pig inoculation gave positive results in all six cases.

The second group was composed of five children in the first year of life. All showed a positive tuberculin reaction and lung changes on x-ray, but no clinical signs in the lung. In one case the bacillus was found on microscopic examination of the stomach content, in four cases it was grown on Petroff's medium, and in all five cases inoculated guinea-pigs showed tuberculous lesions at necropsy. Four of the infants are reported as steadily improving.

The third group comprised four patients all of whom gave positive skin tests. Three of them showed nothing abnormal on physical examination or by x-ray. All four gave negative results in the search for bacilli.

This method provides the most effective means of diagnosing open pulmonary tuberculosis in small children. The authors urge

that cultures be made and guinea-pigs inoculated in those cases in which microscopic examination of stomach contents fails to demonstrate the tubercle bacillus.

A. K. GEDDES

**Enuresis in Hospital Practice.** Horton, K. M., *Arch. Dis. Child.* 4: 20, 1929.

Sixty children from the outpatient department of the London Hospital comprise the author's series. Sixty per cent were girls; 56 per cent were in the period of second dentition. In 57 per cent there was a family history of enuresis; in 13 per cent a rheumatic history; and 95 per cent had had previous illnesses. Enuresis began in the majority of cases after control of micturition had been established; in 5 per cent it was diurnal only; in 30 per cent, nocturnal; in 55 per cent both by night and by day; while in 10 per cent incontinence of faeces was associated with it.

Half the children were free from physical defects; nearly one-quarter had enlarged tonsils and adenoids; and 8 per cent had pinworms. Phimosis was present in only one case. Most of the patients showed some grade of nervous instability; maladjustment with the home was found in over one-third.

Co-operation between mother and child, simple psychological measures with the aim of restoring the patient's self-confidence, and atropine, constituted the therapeutic regimen. The plan included regular weekly attendance at the clinic, an optimistic attitude, the usual dietary measures, regularity of micturition, a record of dry days and nights; tincture of belladonna 5 minims t.d.s., increasing to 35 minims t.d.s.; ammonium bromide 5 grains t.d.s., increasing to 12.

Sixty-five per cent of all cases were cured and 35 per cent improved. The regime outlined was followed for a period of six to eighteen weeks, those cases in which the enuresis occurred both by night and by day sometimes requiring the longer period.

A. K. GEDDES

**The Prognosis of Tuberculosis in Infants.** Gasul, B. M., *Am. J. Dis. Child.* 37: 5, 1929.

In a follow-up study, at Pirquet's clinic in Vienna, of 404 children infected with tuberculosis before the age of 2½ years the author found, one to eight years after the primary infection, a mortality of 3.71 per cent.

On the first examination, 54 per cent of the 404 children showed a positive tuberculin reaction only; 30 per cent showed hilum tuberculosis; and 1.24 per cent showed papulo-necrotic tuberculosis. The period from the first examination to the last examination was eight years in 25 cases, seven years in 34 cases, six years in 64 cases, five years in 100 cases, four

years in 99 cases, three years in 57 cases, and two years in 25 cases.

Twenty-nine infants were infected during the first six months of life; the mortality rate in this group was 17.2 per cent: 73 were infected in the second half of the first year of life; the mortality in this group was 6.84 per cent. Seventy-seven became infected in the first half of the second year of life; this group gave a mortality of 6.49 per cent. None of the children who had been infected after the age of one and a half years died.

Fluoroscopic or roentgenologic examination showed a Ghon tubercle in 8 per cent of the children who had been followed for one to two years after the primary infection and in 34.7 per cent of those who had been followed up for 7 to 8 years. Calcified hilum glands were present in many.

Cases of tuberculous meningitis, miliary tuberculosis, and tuberculosis pneumonia were excluded from the series. Early diagnosis, involving the closer study of dispensary patients, the more frequent use of the roentgenogram and the tuberculin test, is probably the factor responsible for the decreasing mortality rate in the published statistics of infantile pulmonary tuberculosis.

The author concludes: "The resistance of the infant to a tuberculous infection, even during the first six months of life, is high. An infant with a positive tuberculin reaction or even with a definitely recognizable lesion (with the exception of tuberculous meningitis, miliary tuberculosis and ulcero-caseous pulmonary tuberculosis) should not be given a poor prognosis."

A. K. GEDDES

### PATHOLOGY

**Thrombo-angiitis obliterans.** Buerger, L., *Arch. Path.* 7: 381, March 1929.

Microscopic examination of the veins in this peculiar malady, found almost exclusively among Russian Jews, which the researches of Leo Buerger have made particularly his own, suggest very strongly that the affection is of an inflammatory nature. Buerger, himself, was of the belief that the disease is not only an inflammation but an inflammation due to infection. The final proof of this conception was not forthcoming.

Buerger, in the present communication, has carried the matter one step farther. Four sets of experiments were conducted: (1) simple ligation of the veins of the forearm or arm, for purposes of control; (2) implantation or inoculation of the coagulum from cases of acute thrombo-angiitis obliterans into the lumina of ligated veins; (3) implantation of the coagulum from cases of acute thrombo-angiitis obliterans

against the walls of ligated veins in man; and (4) implantation (as in 3) in monkeys. In all cases the affected areas were removed and examined with the microscope.

Simple ligation was performed in the case of (a) persons without vascular disease; (b) persons with thrombo-angiitis obliterans; (c) persons with moderately pronounced arteriosclerosis. In all these types bland thrombosis resulted.

In the second series of cases an emulsion of material from the vessel in a case of acute thrombo-angiitis obliterans was inoculated into the lumen of a section of ligated vein. This procedure invariably resulted in failure, no coagulum resulting.

In the third series some of the clot from a case of thrombo-angiitis was introduced within the lumen of a section of ligated vein, and material scraped from the wall of a vein in a case of the disease was rubbed on the adventitia of the healthy vein. A benign non-purulent phlebitis resulted in four cases out of eight. Microscopically, the wall of the vein experimented on was infiltrated with inflammatory cells, and the clot showed the characteristic giant-cells. The lesions produced experimentally were, in short, those generally recognized as being pathognomonic of the disease.

Two experiments in monkeys failed to produce more than a bland thrombosis. Perhaps the particular species of monkey employed is immune. No experiments were done at this time to discover the infective agent, which up to the present time remains unknown.

A. G. NICHOLLS

**Primogeniture: Is it a Factor in the Production of Developmental Anomalies?** Macklin, M. T., *Lancet* 1: 971, May 11, 1929.

In this paper, read before the Royal Society of Canada on May 1st, of this year, Dr. Macklin takes issue with Dr. G. F. Still who, in his Ingleby Lectures on Place-in-Family, comes to the conclusion that primogeniture as such plays a large part in the production of developmental defects.

Dr. Macklin has analyzed 1,600 cases collected from the literature. Studying 600 cases of hereditary defects, occurring in 286 families comprised of 1,585 persons, in which the order of birth was stated, she determined the different places in the family where such defects occurred. She also determined the ratio of normal to affected persons in each place in the family. The figures were: 44 per cent of the first-born and 37 per cent of the second-born were affected. This seems to show that the first-born is more often affected than the subsequent children. The percentage gradually falls, however, until the thirteenth child is

reached, in which place 47 per cent of the total number were affected. It would appear, therefore, also, that primogeniture is not so potent a factor in the production of anomalies as is the traditionally unlucky number.

Dr. Macklin next takes the evidence to be adduced from 1,000 cases of congenital defects in which there was no family history of similar conditions. Twenty-eight per cent of the total membership of these families (composed of 3,748 members) and 29.5 per cent of the affected population fell into first place. Further analysis shows that the same proportion of fourth and seventh children are affected as of first, and that from the ninth child to the last there is a greater percentage than in the first place. This strongly suggests that the first-born is not in such a dangerous position as has been supposed.

Still arrives at exactly opposite conclusions. Dr. Macklin believes him to be in error because he plots his curve of place-in-family from statistics based upon a population of which his cases were not a part, assuming that, were his families complete, they would average the same number of children as the population at large. This furnishes a large element of error. The objections to this are that cases from private

practice show a much higher percentage of first-born children than does the population as a whole, since families are smaller among the wealthier classes; also, the appearance of a first mal-formed child is often the reason for restricting the family.

Another cogent argument against Still's view is that in 7 per cent of the series of 1,000 cases the first pregnancy terminated in the birth of one mal-formed child but of a normal twin as well. If primogeniture be at the basis of the abnormality why were not both inhabitants of the uterus affected?

The importance of the matter, apart from its scientific bearing, lies in the fact that an incorrect view of it may lead to the holding out of false hopes to parents. Out of every sixteen families in which congenital defects not obviously inherited occur, there will be at least one family, perhaps more, in which there will be more than one defective child. Dr. Macklin, it may be remarked, believes that all developmental defects are inherited, even if there is no family history of defect. In this case, she does not feel it necessary to draw a distinction between "inherited" and "congenital" conditions.

A. G. NICHOLLS

**Poisoning by Thallium Acetate.**—On April 8th a London coroner's jury returned a verdict of death from poison accidentally administered in the case of three brothers, aged respectively 10, 7, and 5 years, who had been treated for ringworm of the scalp by the internal administration of thallium acetate at a hospital. The value of this drug in the treatment of tinea capitis, based on its property of producing a total, though temporary, alopecia, was first recognized early in the present century by Sabouraud, but it was not until 1918, when Professor R. E. Cicero discovered that by carefully assessing its dosage in terms of body weight he was able to prevent the severe toxic symptoms occasionally attending its administration, that the employment of thallium acetate became at all general. The dose recommended by Cicero, of 8 milligrams per kilogram of body weight with a maximal dose for any patient, however heavy, of 0.3 gram, has been found by dermatologists generally to produce satisfactory results, and it is clear from the evidence at the inquest that the doses actually ordered for the three boys fell well within these limits. On chemical analysis, however, it was found that each dose of the solution administered contained 5.6 times as much thallium acetate as was ordered in the prescription, a blunder which arose not from any carelessness in the actual dispensing, but from the fact that the hospital pharmacist had made a mathematical error in converting the amounts of the prescription from the metric to the apothecaries' measure. The coroner stated in his sum-

ming-up that thallium acetate being a Continental drug its dosage had been worked out on the decimal system. But the need would appear to be for the adoption in the case of all prescriptions of a uniform system of pharmaceutical measurement and symbols. At present, error may arise not only as a result of arithmetical miscalculation, but from the existence of symbols similar in appearance but very different in meaning. The symbol gr., for example, in apothecaries' measure, representing the grain, is commonly used in prescriptions written on the metric system to represent gram. It is, however, only in Britain and in the British Empire that such confusion is likely to arise, and this tragic case provides a further reason for the supersession of the apothecaries' system of measurement by the decimal system adopted practically universally on the Continent and in America.—*Brit. M. J.*, April 13, 1929.

"And yet let us take notice how the Physician, or he that would re-erect a drooping soul, effects his designe by the use of Figures or Charmes, which in themselves are merely fictitious. . . . Physicians use Figures or Charmes, not for any prevalency in them, but that the raising of the soul is of great efficacy in the curing of the body, and raising it from infirmity to health, by joy and confidence is done by Charmes; for they make the patient receive the Medicine with greater confidence and desire, exciting courage, more liberal belief, hope and pleasure."—*Roger Bacon*.

## Obituaries

**Col. James Alexander Hutchison, M.D.** After an illness which caused his retirement three years ago, Col. James Alexander Hutchison, M.D., died on June 30th at the age of 65. For more than 30 years Col. Hutchison had been on the staff of McGill University. During the World War he served as chief surgeon of No. 1 Canadian General Hospital. At the termination of the war he was appointed chief medical officer of the Canadian National Railways.

A native of Montreal he was the son of Matthew and Helen Ogilvie Hutchison. He was educated at Montreal High School, Goderich, Ont., and McGill University, where he graduated in medicine in 1884. He studied in Europe and returned to practice in Montreal. He became chief surgeon of the Grand Trunk Railway at Montreal in 1891 and was later appointed chief medical officer of the whole system.

He was on the staff of McGill University from 1892 till 1923, latterly occupying the chair of surgery and clinical medicine. He was at one time president of the Montreal Medico-Chirurgical Society, a fellow of the American Surgical Association and the American College of Surgeons, a licentiate of the Royal College of Physicians and Surgeons, Edinburgh, and a member of the Canadian and British Medical Associations.

In February, 1916, he went overseas as a member of the C.A.M.C., in order to gather materials for a report of an army medical practice in Europe in connection with Soldiers' Civil Re-establishment. On the completion of his extensive report he was appointed consulting surgeon to No. 1 Canadian General Hospital. For a time he was acting chief surgeon of the hospital. Thereafter he became consulting surgeon in the Foleskstone, England, area and had charge of the Moore Barracks Hospital, Shorcliffe. Returning to Canada in 1919, he became chief surgeon to the Canadian National Railways.

### An Appreciation

Dr. J. Alex. Hutchison died at his country home at North Hatley on June 30th after being invalided for over three years by a severe hemiplegia.

Through his position of Chief Medical Officer to the Grand Trunk and later to the Canadian National Railways he was widely known to the medical profession of Canada and the United States. Railway matters formed one of his chief interests and he had a close acquaintance with the problems of administration as well as with the working conditions of the employees, for whom he always had a warm sympathy. His early years in practice at Point St. Charles gave him an insight into the aims and viewpoints of the working man which he retained throughout life, and enabled him to take a broad view of the relationship

of employer and employee. As a railway surgeon he had an international reputation based not only on his executive work, but also on his skill and experience as an operating surgeon, acquirements gained in a long service as surgeon to the Montreal General Hospital. Dr. Hutchison took a keen interest in all practical questions and there were few subjects of public interest on which he was not well informed and able to express a competent opinion on their merits. His kind and generous nature found expression in aiding others and he never tired in rendering thoughtful services to his friends and indeed to all with whom he was brought in contact. Endowed with a retentive memory he readily recalled details of episodes dating back for years, and was always ready to recall his experiences in a humorous and interesting fashion. Frank and candid in his dealing he was intolerant of any lack of these qualities in others, and his outspoken criticism seldom failed to spare the individual who departed from his own rigid code.

Dr. Hutchison was twice married and leaves his widow, three sons, Dr. Keith Hutchison, Bruce and Ross and a daughter Mrs. Newcombe of Ottawa, to mourn his loss.

F. G. FINLEY

**Dr. F. J. Pattee.** The death occurred at his residence of Dr. F. J. Pattee, son of Dr. R. P. Pattee and Mrs. Pattee, of Hawkesbury, Ont. The late Dr. Pattee was in his 53rd year, having been born in Plantagenet, Ont., in 1876.

Dr. Pattee, who was well known in medical circles in Montreal, received his degree of Doctor of Medicine from McGill University in 1900.

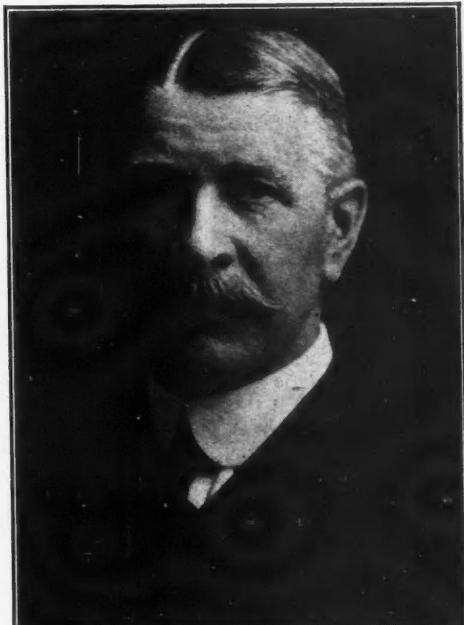
Following his post-graduate work at Edinburgh and Glasgow Universities, Dr. Pattee practised with his father at Hawkesbury and some eighteen

years ago they established a private hospital. Dr. Pattee was a surgeon with wide repute and a family physician revered by all who came in contact with him. He served two terms as mayor of Hawkesbury and took a keen interest in all matters pertaining to the betterment of this Ottawa Valley town.

Dr. Pattee was a member of Trinity Anglican Church and during his lifetime served both as rector's warden and lay delegate to the Synod of the diocese of Ottawa. He was also chairman of Trinity's finance committee and was a member of the Masonic Lodge.

Deceased is survived by his wife Mary E., daughter of the late James Gibson; four sons, Richard Percival, of Montreal; Frank Lyall, James Grant and Chauncey Johnson; two daughters, Phila Margaret and Dorothy Gibson, the latter the wife of F. Vernon Robinson, of Toronto, his parents, four sisters and two brothers.

The funeral took place from his late residence on July 15th to Trinity church. Interment was made in Cassburn cemetery.



Col. James Alexander Hutchison, M.D.

**Charles Perry Templeton, C.B.E., D.S.O., V.D., M.D., C.M.** In the tragic death, on June 12th, of Colonel C. P. Templeton Brandon lost one of her most widely known and popular citizens and medical men.

Dr. Templeton had that morning just finished an operation for which he had been called to Rivers, and was on the point of returning to Brandon. Picking up a group of High School girls who had been admiring his car, he took them for a spin along the road. For some reason the car suddenly swerved, left the road and turned over, pinning underneath all the occupants but one. The others, though seriously, were not dangerously injured, but Dr. Templeton, on being removed, was found to have sustained very grave injuries to which he shortly afterwards succumbed.

Dr. Templeton was born forty-five years ago in Napanee, where his father, the late William Templeton, was the editor of "The Beaver" newspaper. He received his early and High School education in his native town, and his medical education at Queen's University, Kingston, graduating in 1906. He then spent a year in post-graduate work in New York City. In 1907 he came west to Brandon, where, except for the War years, he resided up to the time of his death, building up a highly successful practice, with surgery as his specialty.

In 1909 he married Alice, youngest daughter of Judge and Mrs. T. D. Cumberland, Brandon, but was predeceased by his wife in 1914. He is survived by a daughter, Margaret, who has been attending Bishop Strachan's School, Toronto; by his mother, Mrs. William Templeton of Napanee; by a brother, W. A. Templeton, of Napanee, Ont., and by three sisters, Mrs. G. H. Carlisle of Winnipeg, Mrs. Macintosh, and Mrs. F. Van Evers of Toronto.

Colonel Templeton was a man of many parts. His chief interests were surgery and Field Ambulance work, but he was also interested in First

Aid instruction and in sport. He was an ardent horseman up to the time of his death. As a medical student he had been centre scrummage for Queen's when that University held the Intercollegiate Championship, and ever since he has been interested in and a supporter of all field sports. In politics he was a Conservative, in religion a Presbyterian, transferring his allegiance to the United Church at the time of the Union. He was a man with whom punctuality was a ritual. He was generous to his friends and was never heard to speak ill of those with whom he did not agree. He was deeply interested in returned soldiers' organizations, and in many ways had frequently shown himself to be the friend of the veteran. For years he had been instructor in First Aid to the nursing staffs of both General and Mental Hospitals, as well as in connection with Field Ambulance training. Under his instruction and through his encouragement many St. John's Ambulance Certificates in First Aid have been won in Brandon.

It was, however, in the Militia and in the Great War that Colonel Templeton made his greatest contribution and won the greatest distinction. His interest in the Canadian Medical Corps dated from so early

an age that for years he had been privileged to wear the Volunteer Decoration for long service. He was largely instrumental in organizing the 21st Cavalry Field Ambulance in Brandon, and was for years both before and after the War its Commanding Officer, only relinquishing that post in 1928 when he was transferred to the Command of the 21st Cavalry Field Ambulance Reserve. Always will his name be associated with the traditions of that unit.

At the very outbreak of War in 1914 he offered his services and became a major in No. 3 Canadian Field Ambulance, taking with him a body of followers from Brandon. With this unit he followed the fortunes of the First Canadian Division to Valcartier, Salisbury Plains, and then to France and Belgium, and through that first great ordeal of the Canadians, the Second Battle of Ypres and the succeeding battles. He rose to the command of his own Field Ambulance and was wounded at Vimy Ridge. He finally became A.D.M.S. of the Third Division, was promoted to the rank of Colonel, and only returned to Canada after the cessation of all hostilities.

The distinction of Colonel Templeton's military service is attested by the many decorations with which he was honoured. He was made a Commander of the Order of the British Empire, and a Companion of the Distinguished Service Order. His name appeared in the despatches of Sir Douglas Haig.

As a fitting close to such a career, the funeral, which was held on Sunday, June 16th, was a military one, in which as a soldier the late Colonel Templeton was accorded full military honours.

J. H. EDMISON  
C. A. BARAGAR



Charles Perry Templeton, C.B.E., D.S.O.,  
V.D., M.D., C.M.

**Dr. Charles Stanley McVicar** of the staff of the Mayo Clinic died suddenly at 4:00 p.m. June 29th, at Winona. He had gone to Winona to

play golf. At the second hole, he felt so ill that he returned to the club house, where he collapsed in the shower bath. The cause of death was coronary sclerosis. Dr. McVicar was forty-nine years of age, was born April 5, 1880, in MacGillivray township, Middlesex County, Ontario. He was educated in the public and high schools in Ailsa Craig and Parkhill. At the age of nineteen he enlisted with the Canadian forces for service in South Africa, and served two years with the Strathcona Horse. On his return to Canada he entered the Western Medical College, London, where he studied for two years from 1902 to 1904. The last two years of his medical course were taken at Toronto University, where he was graduated as Silver Medallist in 1907. He served eighteen months as interne at the Sick Children's Hospital, Toronto, and six months at the Manhattan Hospital, New York. On completion of his hospital training he engaged in practice in Toronto and was associated with the teaching staff of his Alma Mater.

During the World War Dr. McVicar again served with the Canadian Forces, this time in Salonika, where he was mentioned in dispatches for distinguished service, March 29, 1917, by General Milne. He was pro-

moted to the rank of lieutenant-colonel and served as Chief of Medicine in the Orpington General Hospital, England. From here he was recalled to Toronto to take charge of the Christie Street Orthopaedic Hospital which was the central orthopaedic institution of the Canadian Army.

Dr. McVicar visited the Mayo Clinic during the autumn of 1920 at which time he was invited to join the staff of this institution. He came to Rochester with his family in January, 1921, and became a member of the medical staff. His interest was largely in the field of gastro-enterology. Owing to his outstanding ability, personality, and industry he was soon made head of a section in gastro-enterology and Associate Professor of Medicine, the Mayo Foundation Graduate School of the University of Minnesota. He was deeply interested in teaching and investigation. In ward rounds he was usually attended by many visiting physicians who quickly learned to recognize his ability as a teacher. He made several solid contributions to our knowledge of diseases of the gastro-intestinal tract and liver, in part due to his interest in the borderline between medicine and surgery in these diseases.

In 1912, he married Miss Mary Gillies of St. Mary's, Ontario, who together with his son George and daughter Jeanette survives him. He is also survived by his mother, of Ailsa Craig, Ontario, and by his brother George of Cayley, Alberta. He was a member of the Presbyterian Church.

His broad viewpoint in medicine, his interest in both the clinical and scientific sides of medicine, his firm, sincere and fearless character, likeable personality, dry sense of humour, his love of home and capacity for friendship marked him for leadership. He was an excellent speaker and was in great demand for medical meetings throughout the United States and Canada. In the death of Dr. McVicar the Staff of the Mayo Clinic has lost one of its most valued and best loved members.

**Dr. Henri Descoteaux**, of Montreal, died in Rivière du Loup Hospital on June 21st, as a result of injuries received when his car collided with another near Trois Pistoles.

Dr. Descoteaux graduated in medicine from the University of Montreal only a month before.

**Dr. J. T. C. Laing.** The death of James Thomas Currie Laing, M.B., C.M. Edin., at the age of fifty-seven, recalls the early gold-rush days and "The Trail of '98." After graduation, Laing was appointed house-surgeon to Professor Annandale, Lord Lister's successor in the Chair of Clinical Surgery. Being blessed with the spirit of enterprise, he proceeded to Canada and joined the rush to the Klondyke, where he acted as Assistant-Surgeon to the Good Samaritan Hospital, Dawson City. Later, he joined the Canadian Scouts as Medical Officer and served through the South African War. For a number of years he carried on a successful practice in London, where he was for many years the active and popular secretary of the Edinburgh University Club of London.

GEORGE GIBSON

**Dr. Albert S. Martin**, formerly a prominent physician of Lindsay, Ontario, died at the residence of his son in Winnipeg, on July 7th at the advanced age of 89 years.

He was born in Toronto and educated in Ontario schools. When the Fenian Raid threatened Canada he volunteered, saw active service, and was awarded the medal granted for that campaign. In Lindsay he practised with Dr. Kellicp Martin and Dr. De Grassi. During the Great War he lived in Port Arthur and in 1919 moved to Winnipeg where he resided up to the time of his death. He is survived by his widow, one daughter, and three sons.

## News Items

### BRITISH EMPIRE

#### The British Association in South Africa

The British Association for the Advancement of Science is holding its annual meeting this summer in South Africa, under the presidency of Sir Thomas H. Holland. It will celebrate its centenary in 1931, being one year older than the British Medical Association. The first part of the meeting was held in Capetown from July 22nd to 27th; the second part in Johannesburg and Pretoria from July 30th to August 5th. At the inaugural general meeting in the City Hall, Cape-town, the association was welcomed by the Earl of Athlone, Governor-General of the Union of South Africa, and after the induction of the new president Mr. J. H. Hofmeyr gave his address as president of the South African Association for the Advancement of Science on "Africa and science." On July 23rd there was a discussion on science and industry; on July 25th Sir Ernest Rutherford gave an evening discourse on the structure of the atom; and on July 26th Professor Julian Huxley gave a public lecture on evolution. At Johannesburg the association was welcomed by the mayor; Sir Thomas Holland gave his presidential address; and there was a public lecture by Professor

G. H. F. Nuttall on yellow fever in Africa. At Pretoria public lectures were given by Professor J. H. Priestley on "The growth of a tree," and by Professor A. S. Eddington on "The interior of a star." The scientific work of the annual meeting was divided among thirteen sections. In the Section of Chemistry Professor G. Barger's presidential address was on the relation of organic chemistry to biology. This section held a joint discussion with the Section of Mathematical and Physical Sciences on quantitative chemical analysis by x-rays and its applications. The Section of Zoology held a joint discussion with the Section of Physiology on experimental biology, and another on the nature of life, in which the Section of Botany also took part. Among the papers read to this section was one by Professor H. B. Fantham on protozoa found in South African soils, and another by Dr. Annie Porter on the hookworm problem in South Africa. The program for the Section of Anthropology included an account of the Taungs skull by Professor Raymond Dart, and several anatomical papers on the native races of South Africa. In the Section of Physiology Professor W. E. Dixon gave his presidential address at

Capetown on July 24th, on "Physiology the basis of treatment," and a joint discussion with the Sections of Physiology and Chemistry on vitamins was opened by Professor E. Mellanby and Professor A. Harden. The papers read to this section when it reassembled at Johannesburg included one on the influences of light on physiological functions, by Professor A. D. Stammers, another on the effects of dust inhalation, by Professor Mavrogordato and Professor J. S. Haldane; another on some factors controlling the structure of the teeth and their susceptibility to caries, by Mrs. Mellanby; and another on cancer and diet, by Dr. S. Monckton Copeman. There was also a joint discussion on problems connected with deep-mine ventilation, introduced by Professor Haldane. The Section of Psychology arranged a joint discussion with the Section of Educational Science on psychological tests in relation to education and vocational guidance; Mr. F. C. Bartlett's presidential address dealt with the experimental method in psychology, and Dr. C. S. Myers read a paper entitled "A new interpretation of adap-

tation." In the Section of Educational Science, under the presidency of Dr. C. W. Kimmins, Sir Richard Gregory presented a report on science and the school certificate examination, and discussions were held on the teaching of science in schools and on the professional education of South African natives.

#### Leprosy in the Empire

Dr. Robert G. Cochrane, Medical Secretary to the Mission to Lepers since 1924, has been appointed Secretary of the British Empire Leprosy Relief Association, which was formed six years ago under the patronage of the Prince of Wales for the purpose of eradicating leprosy within the Empire. Dr. Cochrane has spent some years in India as Medical Secretary to the Mission to Lepers, and made his headquarters at the largest of the Indian leper hospitals at Purulia, Bengal. He undertook leprosy research, and in the study of the subject visited Siam, Malaya, the Philippines, Korea, Japan, and other Asiatic countries.

### GREAT BRITAIN

#### Charles Darwin's Home

At the meeting of the British Association in 1927, Sir Arthur Keith, as President, made an appeal for the preservation of Down House, in the county of Kent, as a memorial to Charles Darwin, who lived there from September 14, 1842, until his death on April 19, 1882. As recorded in our issue of September 10, 1927 (p. 464), an immediate response to this appeal came from Mr. George Buckston Browne, F.R.C.S., F.S.A., who undertook to make himself wholly responsible for buying the estate and establishing a fund for its upkeep, in order to permit future generations to visit Darwin's home. Having acquired the property, Mr. Buckston Browne offered to transfer its possession to the British Association under the most liberal conditions, and with an endowment for its maintenance for all time. His desire was that Down House should be regarded as a gift to the nation, and that the British Association should use the building and grounds for the benefit of science. The General Committee of the Association thereupon authorized its President to accept with gratitude this munificent offer.

During the past six months Mr. Buckston Browne has fully restored the whole building and brought back the ground floor rooms—particularly the "old study" in which the *Origin of Species* was written—as far as possible to their condition in Darwin's time. Members of the Darwin family and other friends have generously co-operated in the work of restoration in order that the furniture and decoration of the lower rooms of the house might call to mind the surroundings in which Darwin thought and wrote for the greater part of his working life. The donor has devoted himself also to getting together the nucleus of a Darwin Collection for Down, and commissioned Mr. John Collier to paint replicas of his portraits of Darwin and Huxley to be hung there.

The formal opening of Down House as a public memorial to the great naturalist took place on the afternoon of Friday, June 7th, when a large and distinguished company attended a garden party given by the President (Sir William Bragg) and officers of the British Association in the grounds of this secluded country house on the chalky Kentish uplands. The ceremony was held on the lawn under the presidency of Sir William Bragg, at whose invitation Mr. Buckston Browne formally presented the house into the keeping of the British Association, and gave a brief address. Darwin, he said, influenced the mind not only of his own generation, but of the whole world for all time.

Like Shakespeare, he was so great that he required no monument, but it might be permitted to them to preserve and keep sacred the house that sheltered Darwin and the things he handled and the grounds he walked on. This it had been his great privilege to be allowed to accomplish, with the willing assistance of Major Leonard Darwin (only surviving son of Charles Darwin) and other members of the family.

Sir William Bragg, in accepting the property as a national memorial, expressed the gratitude and appreciation of the officers of the British Association, not only for the gift itself, but also for the immense pains taken by Mr. Buckston Browne in supervising personally the work of restoration.

Sir Arthur Keith then, at the President's request, declared Down House open to the public. They were assembled, he said, at a place which enshrined the personality of a great man, whom they were justly proud to claim as English through and through. Their distant successors would be proud of it, not so much perhaps on account of the books which were composed and written within its walls, but rather because of the personality of the man who wrote them—a man both good and great. It was right to stress this personal aspect of Darwin's life: he was an English gentleman, gentle and modest almost beyond parallel, living and loved in his home as few men had been; thoughtful for his community, just and charitable, even to those who sought to brand him as an enemy of mankind. Unwittingly Darwin had made these few acres of upland an international possession; in these grounds and within these walls were slowly hammered out new doctrines, which had penetrated to the ends of the earth, giving humanity a new interpretation of living things and its relationship to them. In entrusting his gift to the British Association Mr. Buckston Browne had made no stipulations, for he did not wish Darwin's home to be bound by the dead hand of the law. He had expressed, however, three personal wishes: that the house and grounds should be maintained as nearly as possible as Darwin knew them; that visitors, irrespective of nationality or creed, should be given free access to the public rooms and grounds; and that the officers of the British Association should use Down House to advance the cause of science in such manner as they thought best. In conclusion, Sir Arthur Keith recalled the profound impression made upon him by his first visit to that place, when he obtained a background for a mental picture in which the living Darwin moved, experi-

mented, and thought. It seemed to him that a student would never know Darwin until he knew Down. Science could not be separated from personality. In making this place a national heritage they were acknowledging that sentiment had a place in science—not in the work of the laboratory, but in the heart of the scientific worker. They were not dedicating a monument to Darwin's memory, for he needed none; his works would outlast anything they could build in stone. They were giving way to a sentiment, an impulse, which was deeply implanted in human nature.

Dr. R. Anthony, professor of comparative anatomy at the National Museum of Natural History in Paris, briefly conveyed the congratulations of French science; and Dr. Joseph Leidy, speaking on behalf of American science, recalled that Darwin was elected a corresponding member of the Philadelphia Academy of Natural Science immediately on receipt of the first edition of the *Origin of Species* in America. Among the congratulatory messages read by the President was one from Professor Henry Fairfield Osborn, President of the American Association for the Advancement of Science. A sympathetic article by Professor Osborn on the restoration of Darwin's House at Down appears in the issue of *Science* for May 24th.

An important part of the afternoon's proceedings was the pious pilgrimage made by every visitor to the kitchen garden and experimental greenhouses, and to the plantation with its "sand-walk," where Darwin paced up and down every day swinging his iron-shod stick and meditating on his work.

Charles Darwin was the son and grandson of medical men, and the estate at Down was purchased for him by his father, Dr. Robert Waring Darwin of Shrewsbury. He himself studied medicine for a time, and his third son and biographer, Sir Francis Darwin, was a graduate in medicine. A member of our profession made the first public appeal for the preservation of Down House, and another has with splendid generosity carried through the project. It was appropriate, therefore, that at the opening ceremony the principal speeches were made by Sir Arthur Keith and Mr. Buckston Browne, and that the company included Sir John Rose Bradford, President, and Sir Thomas Barlow, Past-President, of the Royal College of Physicians of London, and Sir John Bland-Sutton, Past-President of the Royal College of Surgeons of England. In conclusion, we may note that Mr. Buckston Browne represents the fifth medical generation of his family, the first of the line having been Dr. Theophilus Browne of Derby, who was a fellow townsman and contemporary of Dr. Erasmus Darwin, grandfather of Charles Darwin.—*Brit. M. J.* 1: 1086, June 15, 1929.

#### Public Health in England

England has the cleanest bill of health of any first-class nation in Europe.

The general health of Great Britain is exceptionally good according to an official statement issued recently by the Ministry of Health. Indeed, the total death-rate of 11.7 per 1,000 is within 1 per cent of the lowest on record. The International Statistical Year Book issued by the League of Nations fully bears out these figures.

Italy had a death-rate of 16.6 per 1,000 in 1925, the latest year for which figures were available. France's rate was higher at 17.7 per 1,000. Belgium was better with a rate of 13.1, while Spain was worse with 19.4. England beat all of them with 12.2 per 1,000.

But when standardized to correct for the deviation of the sex and age distribution the English death-rate is reduced to 10.6 (per 1,000).

England, by means of its highly organized system

of sanitation, its elaborate provision for the maintenance of public health, and the excellence of its housing and social conditions, has eliminated the great killers among the infectious diseases, the scourges that John Bunyan so well named "the captains of the men of death."

Typhus, typhoid, and plague are dead. Small-pox is moribund. The severe type of the last-named disease brought from abroad in the liner *Tuscania* has now terminated.

#### Presentation of a Ceremonial Staff to the British Medical Association

A meeting of the Council of the British Medical Association was held at the Association House, Tavistock Square, on April 3rd. Dr. H. B. Brackenbury, Chairman of Council, was in the chair.

A pleasant little ceremony took place before the Council had been long in session—namely, the presentation by the Treasurer, Mr. Bishop Harman, of a ceremonial staff bearing the Association badge. The staff, which was much admired, consists of a symbolic device on a long pole, after the fashion of the ancient Roman standards. The core of the device is the erect pine club, coiled around which, in the characteristic figure of eight, is the serpent. The front panel bears the letters "B.M.A." in raised Roman capitals, and the back records that it is the staff of the British Medical Association, and by whom it was presented. The whole device is wrought in sterling silver, the serpent is silver gilt, with eyes jewelled with carbuncles, and the shaft is of English oak wood, polished black, with silver screw-joints to facilitate dismantling and carriage, and a silver ferrule. The height of the standard is 7 ft. 4 in. The silver is stamped with the hall-mark of the Goldsmiths' Company of London for this year. The work has been executed by Mr. Henry Stocker, formerly teacher in the Metal Section of the Royal College of Art, South Kensington.

The Treasurer asked the Council to receive this staff on behalf of the Association. The Chairman, amid hearty applause, said with what great pleasure the Council received this handsome gift, and how sincerely it thanked the Treasurer for his thoughtfulness and generosity. The Treasurer, in response, said that he was pleased that the staff had found favour in the eyes of the Council. Possibly at some distant date it would gain an intangible interest altogether beyond its original value.

#### Honour to Sir Charters Symonds

The honorary degree of Doctor of Laws has been conferred upon Sir Charters Symonds, consulting surgeon to Guy's Hospital, by the University of New Brunswick, Canada, of which province he is a native. Sir Charters has signalized the occasion by founding a prize in history in honour of James Simonds, the original English settler at the mouth of the Saint John River.

Sir Charters, three or four years ago signalized his interest in the medical development of the land of his birth by donating his private collection of pathological specimens to the Medical Faculty of Dalhousie University, Halifax.

#### Birthday Honour

The Honours List issued on June 3rd, on the occasion of His Majesty's birthday, included the name of the following member of the medical profession.

#### Order of Merit

Robert Bridges, M.A., M.B., D.Litt., LL.D., F.R.C.P., Poet Laureate. In recognition of his eminent position in the world of literature.

## NOVA SCOTIA

The annual meeting of the Medical Society of Nova Scotia was held at Pictou Lodge during the last week of June. The Lodge, a delightfully situated summer hotel, had not been opened for regular business and was made available to the Society alone for the annual meeting. It was thus, in effect, a medical club for the time. Beautiful weather permitted of several sessions being held on the spacious verandah at the edge of the sea. There was an excellent attendance, and the meeting was in every way successful. Speakers from without the province included Dr. Grant Fleming, of Montreal, Dr. Harvey Agnew, of Toronto, and Miss Mary Beard, of the Rockefeller Foundation. A feature of the meeting was a request from the Minister of National Resources for advice relative to the re-organization of the Provincial Department of Health, and for a committee of the Society to advise the Government relative to its health policies. Needless to say, this request was welcomed. The Society advised the correlation of hospital, sanatorium, and tuberculosis and other health activities in one department under a physician with the status of Deputy Minister of Health, and appointed a representative committee to co-operate with the government. Next year the Society is to meet at the New Pines, Digby, under the presidency of Dr. E. O. Hallett, of Weymouth. Drs. A. MacD. Morton, M.L.A., of Halifax, and L. W. Johnstone, M.P., of Sydney Mines, were elected Vice-presidents; and Drs. Smith L. Walker and J. G. D. Campbell, Halifax, were re-elected Secretary and Treasurer respectively.

The annual refresher course of the Dalhousie Medical School is to be held this year during the week beginning August 25th. This course, which is given free of charge and is open to all medical practitioners, irrespective of residence or alma mater, has established a reputation for excellence and practicality which extends well beyond the maritime provinces. The program for this year will be quite up to the standard. As there is to be a reunion of Dalhousie graduates on the twenty-eighth, twenty-ninth, and thirtieth of August, the afternoons of those days are to be left open to permit those attending the refresher course to take part in the re-union festivities.

Dr. Clyde W. Holland, who was assistant in Pathology and Bacteriology at Dalhousie University last session, has been awarded a Rockefeller Fellowship for work in Clinical Medicine and associated scientific subjects. Dr. Holland is a graduate in both Arts and Medicine of Dalhousie University, and has had a varied experience in post-graduate studies. His college career was brilliant, notwithstanding an interruption in his medical course of three and a half

years during which he served with the colours overseas. His fellowship work will be taken under Professor Christian, of Harvard University, at the Peter Bent Brigham Hospital.

At the graduating exercises of the Aberdeen Hospital, New Glasgow, nine nurses were awarded the diploma of the training school. Addresses were delivered by Drs. R. M. Benvie, of Stellarton, and J. G. MacDougall, of Halifax. The Ladies' Auxiliary of this hospital recently presented the institution with a new motor ambulance costing \$3,000.00.

Sixteen candidates wrote the June examinations of the Medical Council of Canada at Halifax. For the clinical and oral examinations the examiners were Drs. A. L. Abramson, G. A. B. Addy, J. M. Barry, and M. Case, of Saint John; G. G. Melvin, of Fredericton; and H. B. Atlee, W. D. Forrest, D. J. MacKenzie, K. A. MacKenzie, and George H. Murphy, of Halifax.

The new building of the Highland View Hospital, Amherst, erected to replace the structure destroyed by fire in May, 1928, has been completed, and is in every way a credit to the town. Accommodation is provided for fifty-four patients. The furnishings and equipment are thoroughly modern. A building for a nurses' residence is approaching completion.

Eleven pupil nurses of the Nova Scotia Hospital, Dartmouth, have successfully completed the examinations for the diploma in nursing.

Dr. R. W. Kenney, who graduated in medicine at Dalhousie University in 1924, and has since spent much of the time at post-graduate study abroad, has won the coveted F.R.C.S., England. Dr. Kenney's career has been brilliant throughout. He is a son of Mr. W. W. Kenney, Superintendent of the Victoria General Hospital, Halifax.

Dr. Ralph P. Smith, Professor of Pathology at Dalhousie University, has received the Bellahouston Gold Medal for 1928 from his alma mater, the University of Glasgow. This award is for the thesis he submitted for the degree of M.D., which was considered "worthy of this highest distinction."

Dr. Gerald Burns, of Halifax, has completed a year of graduate study in Internal Medicine at Philadelphia. After graduating at Dalhousie in 1925, Dr. Burns spent a year on the interne staff of the Victoria General Hospital, following which he was for two years on the medical staff of the Nova Scotia Sanatorium, Kentville. W. H. HATTIE

## NEW BRUNSWICK

At the meeting of the Canadian Medical Association in Montreal, recently, New Brunswick was represented by a fairly large and representative delegation. Included in this number were: Dr. P. Laporte of Edmundston, Dr. A. Myers of Moncton, Dr. G. C. Vanwart of Fredericton, Dr. C. Veniot of Bathurst, Dr. R. A. Hughes, Dr. G. B. Peat, Dr. J. R. Nugent, Dr. A. S. Kirkland and Dr. Murray MacLaren of Saint John and Dr. H. E. Britton of Moncton. Everyone was delighted with the program and hospitality provided at Montreal.

The contract for the addition to the Moncton

City Hospital was awarded, on June 22nd, to Ambrose Wheeler, Ltd. The contract price was \$323,679.00. The first sod will be turned just as soon as possible and it is expected progress will be rapid.

The Sisters of the Hotel Dieu Hospital, at Chatham, recently celebrated the diamond jubilee of their coming to Chatham at a three day ceremony. Sixty years ago the hospital was of three-bed capacity. To-day, the Chatham Hotel Dieu is one of the best equipped of our Maritime hospitals and associated with the hospital work, the sisters have carried on a

very extensive religious and educational parochial scheme.

On June 6th, at Monetton, Rev. Sister Mary, R.N., Superior of Inverness, N.S., Hospital was elected president of the Maritime Conference of Catholic Hospitals Association. The annual meeting in 1930 will be held at Glace Bay. At this final session of the Conference, a paper of surgical interest was read by Dr. A. E. Myers of Monetton.

At a meeting of the Women's Institute in Fredericton, Dr. Chas. Dumont of Campbellton spoke on the subject of "Maternal welfare."

Dr. H. A. Farris, of the Saint John County Hospital, attended a meeting of the Canadian Tuberculosis Association held in Hamilton.

At the graduating exercises of the nursing school of the Soldiers Memorial Hospital at Campbellton, the special speaker was Dr. W. W. Chipman of Montreal.

At the meeting of the fire prevention association in Ottawa, the first of this month, the New Bruns-

wick Hospitals were represented by A. S. Kirkland, M.D., of the General Public Hospital Saint John. At this meeting the fire risk caused by the storage of x-ray films was thoroughly discussed. The co-operation of hospital authorities, radiologists, fire marshalls and insurance companies was extremely close and satisfactory. It is felt that this collaboration would result in measures which will obviate any further fire hazards in hospital institutions.

The New Brunswick Medical Association will hold its annual meeting in Saint John on July 16th and 17th. An excellent program has been provided, and this year it is expected to include a golf tournament for the physicians in the program of entertainment.

The writer of these notes was privileged to receive a photograph of the Editor of the *Canadian Medical Journal*, Dr. A. D. Blackader, during his stay in Montreal recently. This token was much appreciated and, no doubt, other reporters have gone to their various homes carrying with them a renewed interest in the *Journal* and cherishing this evidence of the thoughtfulness of Dr. Blackader.

A. STANLEY KIRKLAND

## QUEBEC

Physiologists from all parts of the world are expected to visit Montreal on September 5th and 6th next after attending the International Physiological Congress in Boston during the third week of August, this being the first time that the international meeting of physiologists has been held in America. Approximately 150 of the 600 physiologists who will attend the meeting at Boston are expected to include Montreal on their itinerary, sailing from here after a two days' stay to different parts of the world. McGill University and the University of Montreal are arranging a joint entertainment and it is expected that the City of Montreal will give the visitors a banquet.

Work on the new hospital at Thetford Mines has already started. It is expected that the hospital will be completed in the fall. It will have a capacity of 100 beds and is located in the midst of the mining district, thereby helping to relieve the existing hospital at St. Maurice de Thetford of a number of cases.

Sorel with a rate of 480.0 led the province as regards infantile mortality for the month of March, according to vital statistics issued by the Provincial Health Department. St. Jerome, which had a rate of 275.0 was second, and Victoriaville, with 214.3, came third for that particular month. Only two points in the whole province reported a clean sheet for March, these being Westmount and Riviere du Loup, while six centres, Levis, Outremont, St. Johns, Kenogami, La Tuque and St. Joseph d'Alma, reported only one case each. Outside the city of Montreal, which had a total of 210 cases of infantile mortality during the month, no other spot had more than 45 cases, Quebec City with 43, ranking next to the Metropolis. There were 860 infantile mortality cases in the province during that month, for a general rate of 124.4 out of which number the cities and towns supplied 391 cases, a rate of 127.1 was compared with 469 rural cases, the latter rate being 122.3.

Periodical medical examination of persons, irrespective of their apparent health, has long been desired by members of the medical profession and a suggestion that something along these lines might be achieved

with the help of the insurance companies was put forward at the recent meeting of the Canadian Medical Association. As a result of the suggestion, conferences have taken place between members of the Medical Association and the Life Officers' Association and a tentative scheme for periodical medical inspection of insured persons has been prepared and will shortly be put into operation. Most of the insurance companies of Canada have agreed to send out notices to their policy holders that they can have the benefit of free medical inspection by a doctor of their own choice on communicating with an officer of the Medical Association appointed for the purpose of making arrangements. This officer will be provided with a list of local physicians, any one of whom will be available for the insured person's choice. The cost of the inspection will be borne by the company. It has been left to the individual companies to determine how frequently this inspection will be made. The probability is that the length of the period will vary not only with the company but also with the amount for which the client is insured. The higher the sum the more frequent opportunity will be given for an examination. No report is to be made by the examining doctor to the company and no records are to be made of the examination other than such as are usually made by the doctor in his case book. This arrangement will encourage policy holders to be examined. Had it been arranged to report the result of the examination to the company, it might have prejudiced the chances of the insured being able to increase the amount of his policy with the company, it was felt. The ordinary man needs, according to the medical profession, to be encouraged to discover and to attend to incipient disease and any scheme that seemed to put a premium on his remaining in ignorance of his ailments would defeat the aim of the whole scheme of periodical examination. As far as can be ascertained this scheme now about to be put into operation in Canada, is the first of its kind for the whole world.

The contract for the new wing, which is to be added to the St. Croix Hospital, has been awarded for \$27,000 for a five storey fireproof building. The new wing will house about 35 private rooms, as well as a

spacious pharmacy. This will allow the old operating room and its connections to be divided into semi-private wards and will about double the present capacity of the hospital, bringing it up to 75 beds. Dr. L. Lane

Charpentier, late of Notre Dame Hospital and University of Montreal has been appointed surgeon-in-chief of the hospital.

GEORGE HALL

## MANITOBA

Dr. H. M. Speechly of Winnipeg has been appointed provincial coroner succeeding Dr. D. H. McCalman who has resigned. The appointment meets with general satisfaction since Dr. Speechly has for many years been distinguished for his public spirit. He is president of the Winnipeg Health League and of the Anti-Mosquito Campaign.

Among those present at the meeting of the Canadian Medical Association at Montreal were Drs. W. Harvey Smith, J. A. Gunn, W. A. Gardner, T. G. Hamilton, E. J. Boardman, J. D. Adamson, J. C. McMillan, A. Gibson, G. A. Brown, Lennox Bell, Geo. Fletcher, A. N. Somerville of Winnipeg, R. J. Waugh, Carberry, E. L. Ross, Ninette, A. F. Menzies, Morden, Dr. Wm. Boyd of Winnipeg was on the program, but owing to the serious illness of his assistant, Dr. Meltzer, he was prevented from being present.

The contract for the erection of the new wing of the hospital for soldiers at Deer Lodge has been awarded to R. N. Wyatt, Winnipeg. The new wing will be similar to the unit built last year and will be of brick and concrete construction. The tender was \$109,997.

Dr. D. A. Stewart who has been seriously ill in the Winnipeg General Hospital is improving but will require rest for a considerable time yet.

In conjunction with the Scientific Club of Winnipeg the Winnipeg Medical Society held a meeting on June 14th, which was addressed by Dr. A. E. Crew, M.B., D.Sc., Professor of Animal Breeding, University of Edinburgh, on the subject, "Disease Eradication through Controlled Breeding."

Dr. G. B. Roatta, of Florence, Italy, and Dr. P. F. Armand-Delille, of Paris, gave most interesting addresses on state control of tuberculosis and the treatment of tuberculosis in children before a special meeting of the Winnipeg Medical Society on June 3rd.

Dr. T. A. Pincock, Deputy Minister of Health, attended the conference of State and Provincial Health Authorities at Washington, D.C.

A second edition of Dr. William Boyd's "Surgical Pathology" has recently been placed on the market.

ROSS MITCHELL

## SASKATCHEWAN

A special clinical meeting of the medical staff of the Regina General Hospital was held June 27th. Dr. Morley Currie presented a case of generalized glandular enlargement with a high white blood count, lymphocytes predominating. The diagnosis had not been made. Dr. C. May presented a case simulating acute lymphatic leukaemia whose first symptom was a profuse gastric haemorrhage; six months after onset the differential blood count was 76 per cent lymphocytes, but clinically the patient was markedly improved, in fact almost ready to go to work again. Dr. U. Gareau presented a paper on infantile diarrhoea in which he classified the different types according to the cause; Dr. C. Hames discussed his paper. Dr. W. M. R. Palmer gave a paper on acute mastoid disease. Refreshments were served after the scientific program.

After a dinner in the Parliament Buildings on July 2nd, the Regina and District Medical Society was addressed by Dr. Charles Sutherland of the x-ray department of the Mayo Clinic, on "The roentgenographic characteristics of bone lesions." His address was illustrated by x-ray slides.

A branch of the Victorian Order of Nurses has been established in Regina. Miss Madeline Taylor, a graduate of the Montreal General Hospital, who has just completed a year of post-graduate work in public health at McGill, has arrived to start the work of the Order.

LILLIAN A. CHASE

## ALBERTA

All the Alberta students attending the eastern universities who wrote on the Medical Council Examinations in the east were successful.

Dr. H. A. Gibson of Calgary, Secretary of the Alberta Medical Association, has just returned from a tour of the medical centres in the east, where he also attended the Canadian Medical Association Convention in Montreal.

Three British doctors who were brought out by the Department of Health, Edmonton, under the scheme inaugurated to render medical service to new settlers

in the sparsely settled outlying districts have arrived. The Government is responsible for their salaries, the district for housing accommodation and the family of the patient for local transportation.

The doctors who have arrived and are on duty are: Dr. Helen O'Brien, M.R.C.S. of England; Dr. Elizabeth Rodger, M.B., Ch.B. of Glasgow; Dr. Mary Percy, M.R.C.S., England.

Dr. Harold McGill of Calgary who underwent a serious operation recently has so far recovered as to commence practice again.

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CANADA

Dr. Moses Weinloss, interne of the General Hospital, Edmonton, has accepted an appointment with Dr. J. J. McDonnell, Edmonton.

Dr. D. L. Dick of the mental hospital, Oliver, has resigned to do post-graduate work, and has been succeeded by Dr. C. P. Fitzpatrick of Ponoka Mental Hospital.

Announcement has been made by the Department of Health, Edmonton, that the contract has been let for a large dormitory at Oliver, near Edmonton. The plan of the government is that the mental hospital at this point shall co-operate with the university in the training of students in psychiatry, and that certain members of the staff will be available for post-graduate clinics for the general practitioners of Alberta.

Dr. W. Cassells who has been on the Brandon Staff (Mental Hospital) has accepted an appointment at Ponoka.

The Sisters have erected a hospital of 15 beds at Altario, and the district is looking for a medical practitioner to establish himself there. There is attached to the position a salary as M.H.O. for the adjacent territory.

Another new hospital is being erected by the Sisters in Alberta this time at Rimbey, a town situated on the Lacombe Northwestern Railway.

The profession of Alberta are looking forward with pleasure to hearing the following men from the east at their Annual Convention in Lethbridge, September 17th, 18th, and 19th: Dr. A. T. Bazin, Montreal; Dr. K. A. MacKenzie, Halifax; Dr. G. H. Murphy, Halifax; Dr. G. E. Richards, Toronto; Dr. G. S. Young, Toronto; Dr. H. B. VanWyck, Toronto. As well as the genial General Secretary who is always a welcome guest in Alberta.

W. G. HUNT

## BRITISH COLUMBIA

The Commission on Health Insurance recently appointed by the Provincial Government has held sessions at Trail and Vancouver. Evidence heard had largely to do with existing forms of medical aid as employed by industrial concerns.

On May 29th the new hospital in North Vancouver was formally opened by the Provincial Secretary, Hon. S. L. Howe. This is a thoroughly modern hospital of sixty beds, enjoying a magnificent view of the harbour.

The annual summer school of the Vancouver Medical Association was held on June 25th, 26th, 27th and 28th. The attendance was 191, which, while slightly less than in former years, shows an actual increase in the number of medical men from British Columbia attending.

On June 11th the joint dinner of the Vancouver and British Columbia Medical Associations was held, following which addresses were delivered by Dr. Armand DeLille of Paris and Dr. G. B. Roatta of Florence, Italy. Dr. DeLille spoke on recent work with Calmette's vaccine, and Dr. Roatta dealt with Fascist activities in public health.

Amongst recent visitors to Vancouver were Dr. W. G. Bissett, of Duncan, and Dr. L. W. Kergin, of Prince Rupert.

Dr. G. Morse, of Port Haney, is at present studying in New York, his practice being taken by Dr. Arthur Manson, recently of the Montreal General Hospital.

Dr. James Wall is spending some months in England and on the Continent.

Dr. W. A. Whitelaw is spending a holiday in the south.

Dr. J. A. West of Prince Rupert is taking a prolonged holiday in England.

New members of the British Columbia Medical Association are Drs. J. A. Tolmie, H. S. Stalker, W. L. C. Middleton and D. M. Meekinson of Vancouver; Drs. J. C. Holmes, Burns Lake, F. H. Stringer, Alert Bay, J. E. Knipfel, North Vancouver, and C. C. Smyth, Ocean Falls.

Dr. H. H. White, of Vancouver, is relieving Dr. J. W. Laing, of Britannia.

C. H. BASTIN

## UNITED STATES

### A Gift to Johns Hopkins Hospital

A sum of \$30,000 has been given by Mr. Adolph Lewisohn, of New York, to endow a Fellowship at the William Holland Wilmer Ophthalmological Institute of the Johns Hopkins Hospital. This gift will make it possible for prospective eye-specialists to remain longer for training under the Professor of Ophthalmology, Dr. W. H. Wilmer. Incumbents will not only be thoroughly trained in the details of ophthalmology but will also have opportunity for research.

### Sedgwick Medal Award

The American Public Health Association announces that the first award of the Sedgwick Memorial Medal will be considered in 1929. This award was established

in honour of the late Professor William Thompson Sedgwick, a former President of the American Public Health Association. The fund which provides the medal was raised by popular subscription from Professor Sedgwick's former students and friends. It is to be awarded for distinguished service in public health.

Except for the fact that it is limited to the recognition of service in the field of public health there is no restriction as to the special line of service that will be considered. Administration, research, education, technical service and all other specialties in the public health profession will receive equal consideration. No limitations as to age, sex, or residence have been fixed, though only candidates who are nationals of the countries in the American Public

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Each capsule of *Vit-Iodum Forte* contains 30 milligrams (about  $\frac{1}{2}$  grain) of Iodine—equivalent to the total content of approximately 5 minims Lugol's Solution (U.S.P. X.). The Vitamin fraction of this new iodo-vitamin combination influences the Iodine function of the thyroid gland and the basal metabolic rate will usually show prompt reduction following the administration of 2 or 3 capsules daily. Cases have been reported where *Vit-Iodum Forte* decreased the B.M.R. after patients had ceased to respond to Lugol's Solution.

This product was discussed in the *C.M.A.J.*, October, 1928, by Gilbert L. Adamson, M.D., and A. T. Cameron, D.Sc., F.R.S.C. By permission of the authors and the *C.M.A.J.* we are able to supply a reprint of this article to members of the Profession.

*Vit-Iodum Medium* (containing 10 mgms. Iodine) and *Vit-Iodum Mite* (containing 1 mgm. Iodine) are also available for prophylaxis and treatment of cases where smaller dosages may be indicated.

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Health Association,—at present, the United States, Canada, Cuba and Mexico are eligible.

The committee in charge will not consider direct applications from candidates, but asks for nominations, giving the information suggested in the accompanying form. Nominations should be addressed to the Secretary, Homer N. Calver, 370 Seventh Avenue, New York, N.Y., and should include the following:

Name of the proposed candidate; residence address; business address; age; country of which the candidate is a citizen; degrees held, date received, and institutions from which received; principal public health positions held; a brief description of the distinguished service performed because of which the

candidate is recommended for consideration. This should include information as to when and where the work was done, the name of the organization or institution, if any, under whose auspices or in whose service the candidate worked, an estimation of the direct or indirect effect of the work measured in terms of life-saving or benefit to humanity. Descriptive articles, reports or similar data published or unpublished will be helpful to the committee. To be considered, the service must have been actually performed and not be merely a plan or suggestion.

Anonymous recommendations will not be considered and the committee reserves the right to refrain from making an award this year.

## GENERAL

### Post-Graduate Work in Paris

The Faculty of Medicine of Paris announced that it will conduct post-graduate courses in English during the month of October, 1929.

Further details of this course may be had on application to this *Journal*, 3640 University Street, Montreal.

### Honour to Drs. C. H. & W. J. Mayo

To mark the occasion of their visit to the Annual Meeting of the British Medical Association in Manchester, Drs. Charles Horace Mayo and William James Mayo were elected honorary members of the Manchester Medical Society at the annual meeting, which was held on May 1st.

### Honour to Professor W. H. Welch

The recently published fourth volume of transactions of the Kaiser Leopold Academy at Halle contains papers by twenty-three members from North, Central, and South America, and is dedicated to Professor William Welch of Johns Hopkins University.

### Honour to Dr. Abraham Flexner

Dr. Abraham Flexner, director of the Department of Educational Studies of the International Education Board in New York has been elected a doctor *honoris causa* of the Medical Faculty of Berlin.

### The Medical Women of Canada

The following officers were elected at the annual meeting of the Federation of Medical Women of Canada, held recently, in Montreal:

President, Dr. Mary Crawford, Winnipeg; vice-presidents, Dr. Mabel Patterson, Dartmouth, N.S.; Dr. M. L. Hanington, Saint John N.B.; Dr. A. C. Macrae, Prince Edward Island; Dr. M. E. A. Abbott, Montreal, Que.; Dr. J. T. S. Manson, Toronto, Ont.; Dr. I. C. Molony, Fort Qu'Appelle, Sask.; Dr. Geraldine Oakley, Calgary, Alberta; Dr. Isabel Thomas Day, Vancouver, B.C.; honorary treasurer, Dr. Ellen Douglas, Winnipeg; honorary secretary, Dr. Edith Ross, Winnipeg; national corresponding secretary, Dr. Helen MacMurchy, Ottawa.

### International Medical Post-Graduate Courses in Berlin

These are arranged with the help of the medical faculty of the University by the Lecturers' Association for medical continuation courses and the Kaiserin Friedrich-Haus. Part of the courses take place permanently, part only in October, 1929, and March, 1930.

### I. Permanent Courses

- (a) Of monthly and semi-monthly duration dealing with all kinds of branches of medicine.
- (b) Courses as guest-assistants in clinics, hospitals and laboratories during 2 to 3 months and longer for gentlemen desiring to do practical work under systematic supervision.

### II Courses in October, 1929

- 1. Group course: "Progress in internal medicine with special regard to stomach and intestinal disease" (from October 1st to 12th) fee RM. 75.
- 2. Course for neurology, psychiatry and psychology (from October 14th to 19th) fee RM. 50.
- 3. Post-graduate course on the domain of children's diseases (from October 14th to 26th) fee RM. 100.
- 4. Course dealing with the chemical and physical foundation of medicine (from October 21st to 26th) fee RM. 50.
- 5. Post-graduate course for throat, nose, and ear specialists (from October 7th to 19th, relatively 26th) fee RM. 100.
- 6. Single courses on all special fields of medical science including practical work.

### III Courses in March, 1930

For March, 1930, the following courses are contemplated:

A course on the different branches of internal medicine.

A course on the progress in the domain of surgery.

A course on skin and venereal diseases.

An x-ray course.

A course on obstetric and gynaecology.

The courses are held in German, but numerous professors are able to lecture in the English, French and Spanish languages.

The information bureau of the Kaiserin Friedrich-Haus für das ärztliche Fortbildungswesen, Berlin NW. 6, Luisenplatz 2-4 instrumental in procuring suitable lodgings, gives information as to cost of stay, arranges the attendance in clinics at operations, etc., and, upon desire, sends detailed syllabuses.

We have received from Dr. Patton an account of an impressive ceremony lately carried out at the King Edward Hospital in Bermuda, when a portrait of Dr. E. C. Wilkinson was formally presented to the Board of Governors by Dr. Patton, a Canadian and a graduate of Toronto, who has long made his home in Bermuda. Dr. Wilkinson is referred to in Dr. Patton's eloquent speech as one of the leading figures in Bermuda. "In politics, business and social life he is a wise counsellor



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THE uniform potency and excellence of Mead's Standardized Cod Liver Oil, plain and flavored, is due to a number of reasons. Pre-eminently among them is the control of the cod-fisheries themselves. This is important. Next, the livers are rendered in plants in Newfoundland owned and operated by Mead Johnson and Company. This also is significant.

By control of fisheries, cod are caught in season when the livers are in prime condition for oil production. Rendering stations have been established in close proximity to the fishing waters—48 in number—so that the livers are rendered almost immediately after the fish are removed from the traps.

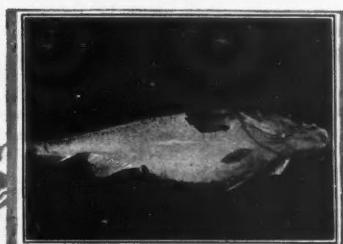


*Washing and inspecting livers*

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Each liver is examined by experienced inspectors—underweight and bile infected livers are thrown out. In addition to the scientific precautions taken by Mead Johnson and Company, strict supervision by the Newfoundland government is maintained over each step in the production process.

*Typical cod with  
enlarged liver*



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and a warm friend. But above everything else he is a medical man."

Dr. Guy Hinsdale, for many years physician at Hot Springs, Virginia, has been appointed Medical Director of the Greenbrier and Cottages, White Sulphur Springs, West Virginia.

The Executive Council of the American Association for the Study of Goitre has announced that a

prize of three hundred dollars (\$300.00) and a medal of honour will be awarded by the Association to the author of the best essay based upon original research work on any phase of goitre, presented at their annual meeting at Seattle, Washington, in September, 1930.

Competing manuscripts must be in the hands of the Corresponding Secretary by July 4, 1930, so that the award committee will have sufficient time to thoroughly examine all data before making the award.

Full particulars of other regulations governing details of the offer will be furnished on application.

## Book Reviews

**Pathology for Students and Practitioners.** Dr. Edward Kaufmann. Translated by Stanley P. Reimann, M.D. Three Volumes; VIII and 2,452 pp., 1,072 illustrations. Price \$30.00. P. Blakiston's Son and Co., Philadelphia; Canadian Representatives, Messrs. McAinsh and Co., Toronto.

This is the authorized translation from the eighth German edition of the *Lehrbuch der pathologischen Anatomie* of Dr. Edward Kaufmann, Professor at Göttingen, which ever since its first appearance has been a favourite in Europe and America. Its translation into English will do much to widen its appeal, already great.

The object of the author of this monumental work was to produce a text-book having the didactic advantage of uniform conception and presentation, one that at the same time would be useful for reference. As a teacher, Professor Kaufmann has had in mind the interests of the student, and, in consequence, has dealt with subjects of special importance to the practical needs of the embryo physician in a more insistent manner and in fuller detail. In order to enhance the interest of his subject, also, he has made excursions into embryology, anatomy, physiology, and general pathology. Be it observed that the book is primarily a text-book of special pathology and morbid anatomy.

The translator, who has performed his arduous task excellently well, has been guided by the principle that the most important thing a teacher of pathology can do is to help prepare students to become good practitioners. He has, therefore, endeavoured to emphasize the relationship of pathology to the sick, and to show how the knowledge of these relationships can help the physician. Accordingly, particular stress has been laid upon what has been termed, in striking, if paradoxical, phrase, "pathological physiology." There is no doubt that, so far as the text is concerned, both the author and his translator have succeeded well in their praiseworthy task. It is to be doubted, however, whether the size of the book, and its price, will appeal to the average student.

The translator has added to the value of the presentation by inserting here and there some new matter, designed to bring the text-book up to the moment. For example, notes on subacute endocarditis, on the effects of short-circuiting the blood from arteries to veins, and on tularemia are to be found. Reference is made to Mallory's idea, for which some evidence has accumulated, that haemochromatosis and bronzed diabetes are due to copper-poisoning, from cooking utensils. Some doubt is expressed as to the rôle of streptococcus in the etiology, and on the subjects of the skin test, antitoxin, and immunization. About one hundred new illustrations have been added. The original illustrations are adequately informative, and have the merit of being drawn by the author himself, but in the matter of artistic beauty the American additions are far superior. Wherever new

matter has been inserted by the translator the fact has been indicated. This is well, as in this way responsibility is properly distributed. In the next issue some small defects should be corrected. In the appendix the headings are sometimes in English and sometimes in German, "Epispadius" for "epispadias" does not seem to be right; in one place the second form is made use of. "Diverticuli" and "diverticulae" will hardly pass muster as plural forms of "diverticulum."

One little matter, having to do with the appearance of the volumes may be mentioned, for it is an unusual feature. The second and third volumes continue in sequence, breaking off in the midst of a disquisition. It would look better if the volumes were started at the beginning of a new chapter, or at least with a new section, with appropriate headings. This is, however, perhaps a matter of taste. Many of these things will later be put to rights, no doubt.

Apart from these minor criticisms, the work is a very valuable one, useful for the student and research worker. The bibliography alone is of the highest value. The general index is repeated at the end of each volume, a somewhat unusual feature. We have little but praise for the work in its essential features.

A. G. NICHOLLS

**Medicine: Its Contribution to Civilization.** Edward B. Vedder, A.M., M.D., D.Sc., F.A.C.S., Lieutenant-Colonel, Medical Corps, United States Army. IX and 398 pp. Baltimore, Williams and Wilkins Company, 1929.

In his preface the author refers to the great advances that have been made of late in science generally, and also in medical science. He points out that the latter has progressed far in advance of its sanitary application. Disease, in large part, could be eradicated if the measures proposed by the health officer were supported by popular opinion and a sufficient supply of money. A further great improvement in health would be made possible by a more general understanding and application of the principles of personal hygiene and the correction of obvious defects detected by periodical physical examinations of the apparently healthy. In order to accomplish these purposes, medicine with its ideals and achievements must be popularized. "It is the aim of this book to do this and to present the more important facts of preventive medicine accurately, but in plain English devoid of technicalities, and at the same time to inject a little human interest."

The book is divided into two parts. Part One deals with the causes of disease, as they apply especially to those diseases that have a more intimate public and personal health bearing—*infectious diseases; nutritional diseases; diseases of the glands of internal secretion; and the degenerative diseases*. Part Two considers the present state of accomplish-

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ment in the prevention of disease, and the problems of the future.

There is much useful information in this book and it is imparted as simply as it is possible to do. We think, however, that in places there is unnecessary detail in a book intended for the layman, unless that layman be well educated and greatly interested. It seems hardly necessary, for example, to go into details about the Wassermann test.

The chapter on nutrition and nutritional diseases is highly informing, and its value is enhanced by a number of interesting tables.

The information given on the prevention of infectious diseases and the control of cancer is most desirable and useful.

The rôle of the hospital and the position of the medical man are dealt with in a way that ought to enlighten the layman, in a way that he will be the better of. The high cost of sickness is discussed frankly and effectively, a subject that is very timely.

Colonel Vedder's book is an excellent one and has been splendidly produced by the publishers. It can be read by medical men with improvement, as well as by the laity, for it is a compendium of useful knowledge, knowledge necessary at times for the physician, but on which he cannot always at the moment lay his hands. The book can be cordially commended.

A. G. NICHOLLS

**The Nurse in Public Health.** Mary Beard, R.N., pp. 217; price \$3.50; Harper and Brothers, New York and London, 1929.

This book is the newest addition to Harpers' Public Health Series. It is not intended to cover the subject of public health nursing but to deal with certain points concerning which the author presents her views as founded upon her experience of twenty-five years. Starting on the basis that a nurse's training is the best preparation for the public health visitor, the value of home visits, the superiority of the generalized plan, and some details of organization are touched on. A chapter is devoted to rural nursing; this includes a description of the work at Fargo, North Dakota, in the State of Kentucky and in the County of East Sussex, England. The story of a day with a negro public health nurse is not only interesting, but it visualizes the health problem of the Southern States. The need for special training for rural work is stressed. In describing administrative problems in large centres, the cities of Toronto and Boston are used as examples. It will be gratifying to Canadian readers to learn that "Toronto conducts a public health nursing department which has come to be known as a model in many ways." What will have a great appeal to the reader is the description of public health nursing in Europe, gained by personal visits of the author, who, apparently, took sufficient time to absorb atmosphere and to appreciate old-world traditions and transitions as something to admire and to build upon rather than to brush aside. A study of maternal care in England and Denmark brings a conviction that we, on this continent, have much to learn from the older lands. The maternal mortality rate in Denmark is 1.75 per 1,000 births. "Every mother in Denmark has a mid-wife, no matter what her class or income." The mid-wife in Denmark is thoroughly trained in a state school, and is guaranteed a minimum salary and a pension. The education of the Public Health Nurse is covered in a chapter of 40 pages and carries the reader into an interesting and stimulating presentation of many points in nurse training, the question of the training school in small hospitals being of particular interest, as is also the comment on the Yale School.

Anyone who is interested in nurse education, in public health, or in hospital administration, will profit

by and enjoy a perusal of this book, which has the great merit of expressing the author's own views, which are based upon experience and observation and which, as such, are well worth the attention of all who have an interest in common with the author.

A. GRANT FLEMING

**Youthful Old Age.** Walter M. Gallichan. XIII and 236 pp. The Macmillan Co., New York, 1929.

There have been many attempts to set forth an adequate philosophy of life. On the one hand we have the Epicurean doctrine "Let us eat, drink, and be merry, for to-morrow we die"; on the other, the ascetic notion that the body must be disciplined for the good of the soul. Between these two extremes wisdom probably is to be found. Walter M. Page has said, in his delightful Letters, that of all peoples the English have best solved the problem of living. Mr. Gallichan is an Englishman, and his delightful little book sets forth in a sane and helpful, and for us a very convincing, manner his views as to right living. The author, a novelist, appears not to be a medical man, but he must have been in contact with medical men, and, moreover, is a man of parts and keen analytical vision. Consequently, his book will be of great value to the general public who wish for guidance in connection with the most important problems of life, and, indeed, may be perused with profit by the medical profession, who are often consulted on such topics, and, too often, have not given them mature thought. The viewpoint of an intelligent layman is frequently well worth considering. The book is a vade-mecum for those who would keep young. It deals with such topics as, The Young Old; Food after Middle Age; Idiosyncrasies; What to Drink; Vitamins; Bathing; Marriage and the Aged; The Disease that Ages (constipation); Renewing of Youth; Work in Old Age; Rest and Sleep; Play and Hobbies; Cares and Fears; The Pace that Kills; Woman; Sex and Health; Corpulence and Leanness; and the Late Evening of Life. For the most part the advice given is sensible and proper, and in these days of fads and "isms," cranks, "uplifters," and false prophets, should be of much help to those groping in the darkness and confusion. The pleasure in the book is enhanced by the bright and racy introduction of Professor Thurman B. Rice, of the University of Indiana, which is quite in keeping with the general tone of Mr. Gallichan's production. As he says, "It is a distinct pleasure to find in Mr. Gallichan's book an advocacy of the prime value of happiness, of contentment, and of reasonable self-indulgence. . . . Isn't it right to enjoy life?" Life as it is set forth in this book is, indeed a "sweet potion of labour and laughter." You had better read about it.

A. G. NICHOLLS

#### PUBLICATIONS RECEIVED

**Transactions of the American Surgical Association.** Vol. 46. Edited by John H. Jopson, M.D. 503 pages, illustrated. Lippincott Co., Montreal, 1928.

**Medical Clinics of North America.** Vol. xii, No. 5, March, 1929. Price \$13.50 for set of six. London & Philadelphia, Saunders Co. Toronto, McAinsh & Co.

**Youthful Old Age.** Walter M. Gallichan. 236 pages. Price \$2.75. Macmillan Co. of Canada, Toronto, 1929.

**The Writing of Medical Papers.** Maud H. Mellish-Wilson. 3rd edition. 184 pages. Price \$1.50. London & Philadelphia, W. B. Saunders. Toronto, McAinsh & Co., 1929.

**Alcohol and Human Life.** Courtenay C. Weeks, M.R.C.S., L.R.C.P., 201 pages, 5 illustrations. Price 3/6 net. H. K. Lewis, London, 1929.

## VACCINATION AGAINST DIPHTHERIA

For the five-year period 1920-25 in the Province of Ontario, *one death in every six* among children between 2 and 14 years old was due to diphtheria.



The majority of deaths from diphtheria occur during the months of the school year.



Diphtheria may be prevented by the use of Diphtheria Toxoid (Anatoxine-Ramon).



Diphtheria Toxoid as developed by Ramon of the Pasteur Institute, Paris, results from the incubation of diphtheria toxin with formaldehyde. It is a particularly stable, accurately standardized antigen which is *absolutely non-toxic*. It contains no serum and is therefore incapable of inducing sensitization to anti-toxins or sera.



In the past three years, diphtheria toxoid has been administered to approximately 500,000 individuals in the Dominion of Canada. Three subcutaneous doses, with an interval of three weeks between doses, have been found to give highly satisfactory results.



*Diphtheria Toxoid (Anatoxine-Ramon) is available in 1-person, 6-person and 12-person packages. Information regarding its use will gladly be supplied upon request.*

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Canada

**How to Stain the Nervous System.** J. Anderson. 139 pages. Price \$1.50. Edinburgh, E. & S. Livingstone. Toronto, Macmillan Co. of Canada, 1929.

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**Le Problème des Glandes à Sécrétion Interne.** XII. **L'Hypophyse.** Price 45 francs. Les Presses Universitaires de France, Paris, 1929.

**SODIUM HYDROSULPHITE IN TREATMENT OF ACUTE ARSENICAL POISONING.**—The use of sodium hydrosulphite in mercuric chloride poisoning has led W. R. Bond and E. W. Gray, to conduct a series of experiments to determine whether the compound would exert any favourable influence in cases of acute arsenical poisoning. These experiments have been carried out on apparently healthy dogs following a twenty-four hour period of starvation, so that the presence of food in the stomach would not influence absorption of the arsenic preparation. To prevent vomiting, 10 mg. of morphine sulphate per kilogram was injected subcutaneously, followed in half an hour by the oral administration of the poison. As a source of arsenic they have employed solution of potassium arsenite-U. S. P. (Fowler's solution), which was administered from a burette into a funnel connected with the stomach tube, and rinsed down with 25 c.c. of tap water. In their first experiment, they employed 1 c.c. of solution of potassium arsenite per kilogram orally, which was immediately followed by the sodium hydrosulphite, 100 mg. per kilogram in the form of a 10 per cent solution, and was rinsed down with 25 c.c. of normal hydrochloric acid. The sodium hydrosulphite exerted a most favourable influence, since both treated animals survived, and the untreated ones died within twenty-four hours. This is of little practical importance from a clinical standpoint, as in most cases of clinical arsenic poisoning there is a considerable lapse of time before the patient comes under observation. The next experiments were conducted with the view of determining the period of effectiveness for the antidote by allowing varying periods of time, ranging from three to thirty minutes, to elapse before the hydrosulphite was administered. The results obtained in this experiment, while somewhat discouraging, plainly show the necessity of

immediate treatment, as well as the rapidity with which potassium arsenite is absorbed from the stomach. The mortality of the treated animals was 100 per cent when the lapse of time was greater than five minutes. All animals treated before this time survived, with the exception of one which died on the sixth day without developing the usual symptoms of acute arsenic poisoning. In the next experiment the quantity of arsenic solution was reduced to 0.75 c.c. per kilogram. Less than 10 per cent of the animals treated with sodium hydrosulphite within ten minutes after the administration of a fatal dose of arsenic died. The mortality of the control animals and those treated after this time was 100 per cent, the greatest prolongation of life being only forty-eight hours. It should be borne in mind that these experiments have been conducted under such conditions as would markedly facilitate the absorption of the arsenic preparation. The presence of food in the stomach, as would ordinarily be the case clinically, would undoubtedly delay absorption of the poison to such an extent that the period of effective treatment would be much prolonged. Bond and Gray do not wish to recommend the use of sodium hydrosulphite in the treatment of acute arsenic poisoning as a measure intended to supplant gastric lavage, the importance of which is unquestioned in poisoning from any orally administered drug. As an adjunct to the latter, however, the compound may prove quite effective, particularly in those cases in which the presence of undigested food in the stomach might embarrass the progress of lavage. The immediate administration of approximate amounts of sodium hydrosulphite may serve to fix or render unabsorbable the arsenic until thorough lavage can be effected, if not to be solely responsible for the patient's recovery.—*J. Am. M. Ass.* 92 1919, June 8, 1929.

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MALARIAL TREATMENT OF GENERAL PARALYSIS.—H. Claude, R. Targowla, and M. Cénac report ten cases of general paralysis treated by malaria infection with beneficial results, subcutaneous injections of 3 to 5 c.c.m. of blood from an infected, untreated patient being used. According to these authors most accidents in this procedure are slight and unimportant, but they enumerate the following conditions as contraindicating the treatment: advanced age, cardiopathy, nephritis, and morbid conditions such as tuberculosis. The plasmodium employed should always be of known virulence, the patient also being kept under strict observation during treatment. Before commencing the injections, a preparatory antisyphilitic treatment is advised, which should be stopped during the incubation and evolution of the malaria, and followed by a mixed treatment of arsenic and quinine. The benefits are an improvement in general health and an amelioration of neurological and mental symptoms; the authors emphasize the fact that many of their patients were enabled to resume professional activities.

A. Ferraro and T. C. C. Fong report similar good results from this method of treatment, and state that even in unimproved cases beneficial results from the malarial treatment of general paralysis can be seen in the prolongation of life of the patient. Their method of administration was the intravenous injection of 2 c.c.m. of the infected blood. Many authors have claimed that the rise in temperature is the real beneficial factor, the patient's response to this permitting a more successful fight against the disease. Other theories mentioned are an antagonism between the plasmodium and the spirochaete of general paralysis, the causation of an immunity reaction, and the establishing of a leucocytosis. Bunker and Kirby hold that a satisfactory outcome may depend, not only on the absence of irreparable anatomical changes, but also on the capacity of the patient to react to the stimulation.

V. Askgaard reports on the hospital treatment of 37 women and 160 men suffering from general paralysis and inoculated with malaria between October, 1922, and March, 1926. Of the 37 women, 6 were much improved, being rendered fit for work, 8 were improved, being rendered partially fit for work, 3 were improved but were still in hospital, 9 were unaffected by this treatment, and 11 were dead, 2 of the deaths occurring in connection with this treatment. Of the 160 men, 25 showed no recurrence, 38 were improved and fit for work, 11 were improved but were still in hospital, 6 were improved but were still nursed at home, 50 were unaffected by this treatment, and 30 were dead, 8 of these deaths occurring in connection with this treatment. With regard to the patients in the first category—namely, the 25 who showed no recurrence of symptoms—it was noteworthy that the disease had existed in most of them for less than a year. All the male patients were also treated with neosalvarsan in connection with the malarial inoculation, but the women were not given specific treatment. The difference in the results among the men and the women was not great enough to warrant the drawing

of conclusions as to the part played by the specific treatment of the men. The author also compares the fate of the subjects of general paralysis before and after the institution of malarial treatment at his hospital, but he gives percentages only and not the actual numbers. During 1917, 55 per cent were dead after one year, 75 per cent after two years, 85 per cent after three years, and 86 per cent after five years. In 1923, on the other hand, only 6 per cent were dead after one year, 15 per cent after two years, and 33 per cent after three years. He concludes that the results of malarial treatment continue to be so encouraging that it is seldom warrantable to withhold it, and it is the more valuable now that recent research has greatly facilitated the early diagnosis of this disease.—*Brit. M. J.*

AXILLARY HYPERIDROSIS.—Dr. Hester M. Henderson writes: A severe case of axillary hyperidrosis was cleared up, after four or five doses, by a half-teaspoonful (ordinary breakfast spoon) of bicarbonate of soda in 2 oz. of water each night. When any slight return of the trouble comes (with extra exercise or hot weather), one dose keeps it down. A cotton vest with sleeves is worn next the skin, summer and winter: this can be boiled when washed. This very simple treatment has turned a miserable state into an easily controlled one. When the trouble is very severe a hot soda bath (handful of ordinary washing soda) distinctly helps.

Dr. J. J. Marlborough writes: I have found a 25 to 30 per cent solution of aluminium chloride in distilled water perfectly satisfactory in a number of cases of localized excessive sweating. The application is allowed to dry on, and is renewed every second or third day. Three applications at these intervals may be made, and then the parts should be left for a week, or until recurrence shows itself. The lotion should be allowed to dry completely before clothing is resumed. Some slight momentary irritation may be caused by the application.

X. Y., writes: I suggest the use of liquor formaldehyde saponatus (B.P.). This is, I believe, an excellent skin antiseptic in cases of dysidrosis, and has a decided drying effect upon the sweat glands. A few drops rubbed over and allowed to dry on the skin are quite effective.—*Brit. M. J.* May 18 and 25, 1929.

BOTULISM FROM INGESTION OF RIPE FRUIT.—Death occurred from botulism in a case reported by Willard J. Stone, in which the symptoms of poisoning developed about half an hour after the ingestion of a ripe persimmon. The early symptoms were nausea and difficulty in swallowing followed within a few hours by diplopia due to extra-ocular muscle paralysis, rapid heart rate due to paralysis of the vagi, and eventually respiratory paralysis. Necropsy revealed as the most important observations acute parenchymatous changes involving the brain, heart muscle, liver, spleen and kidneys, with marked acute fatty degeneration of the heart muscle and liver.—*J. Am. M. Ass.* 92: 2019, June 15, 1929.